A3212_A3408_A3409_A3410_System_Electrical_Schematics

CK

SHEET	PAGE/CSA	CONTENTS		
1	1	TABLE OF CONTENTS		
2	2	SYSTEM: BOM Tables (1/2)		
3	3	SYSTEM: BOM Tables (2/2)		
4	8	SYSTEM: Bootstrapping		
5	9	SYSTEM: Mechanical		
6	10	SOC: USB & Misc		
7	11	SOC: PCIE & NAND		
8	12	SOC: ISP		
9	13	SOC: Display/ISP		
10	14	SOC: Serial		
11	15	SOC: GPIO & SMC & MTP & NUB		
12	16	SOC: AOP		
13	17	SOC: Extra Memory		
14	18	SOC: Power (CPU/GPU & SOC)		
15	19	SOC: Power (SRAM)		
16	20	SOC: Power (Fixed)		
17	21	SOC: Power (DDR & AOP/AVE/ISP/USB)		
18	22	SOC: Power (1V2)		
19	23	SOC: Power (GND)		
20	24	SOC: Aliases: I2C AP/ISP		
21	25	SOC: Aliases: I2C AOP/SMC/MTP		
22	26	SOC: Aliases: GPIOs		
23	27	SOC: Aliases: Misc		
24	28	SOC: Aliases: FF-Specific		
25	30	MICRO NAND: PWR		
26	31	MICRO NAND: I/O		
27	33	SYS PWR: PMU: Bucks (1/5)		
28	34	SYS PWR: PMU: Bucks (2/5)		
29	35	SYS PWR: PMU: LDOs (3/5)		
30	36	SYS PWR: PMU: GPIO (4/5)		
31	37	SYS PWR: PMU: Misc (5/5)		
32	38	SYS PWR: PMU: Aliases: GPIO		
33	39	SYS PWR: PMU: Aliases: Misc.		
34	40	SYS PWR: Charger		
35	42	SYS PWR: VDD_MAIN Sense Resistor		
36	43	SYS PWR: Boost		
37	44	SYS PWR: Wireless Charger		
38	45	SYS PWR: Arue		
39	49	SYS PWR: NTCs (Top)		
40	50	SYS PWR: Charger Sense		
41	52	CAMERA: LPDP AC FILTERS		
42	53	CAMERA: PMU 1: Power (1/2)		
43	54	CAMERA: PMU 1: I/O (2/2)		
44	55	CAMERA: PMU 1: Aliases		
45	62	CAMERA: Actuator Supply (Alex)		
46	65	CAMERA: Strobe Driver		
47	70	PEARL: VCSEL Driver		
48	73	SENSORS: Accel / Gyro		
49	78	AUDIO: Codec: Analog (1/2)		
50	79	AUDIO: Codec: Power & I/O (2/2)		

SHEET	PAGE/CSA	CONTENTS		
51	81	AUDIO: Top Speaker Amp		
52	82	AUDIO: CG Misc		
53	92	TOP MODULE: Touch Power		
54	93	TOP MODULE: Display Power		
55	95	E85: Controller (1/2)		
56	96	E85: Controller (2/2)		
57	97	E85: Mogul/Flash		
58	98	E85: Accessory Power		
59	99	E85: eUSB		
60	100	E85: USB Mux		
61	102	LVL SHIFT: Misc		
62	103	LVL SHIFT: Misc Nets		
63	111	B2B: Sensor		
64	117	B2B: Display/Touch Combo (1/2)		
65	118	B2B: Display/Touch Combo (2/2)		
66	126	TESTING: Test Points		
67	127	TESTING: Test Points (FF Specific)		
68	128	TESTING: Probe Points		
69	129	TESTING: Probe Points (FF Specific)		
70	142	HIERARCHIES: TOP		
71	144	SYSTEM: General Aliases		
72	145	SYSTEM: FF Specific Aliases		
73	180	DEBUG: E85 + Battery B2B		
74	500	Interposer: CG (1/3)		
75	501	Interposer: CG (2/3)		
76	502	Interposer: CG (3/3)		
77	503	Interposer: Aliases (1/5)		
78	504	Interposer: Aliases (2/5)		
79	505	Interposer: Aliases (3/5)		
80	506	Interposer: Aliases (4/5)		
81	507	Interposer: Aliases (5/5)		
82	1	TOC		
83	2	NFC_IO_BOM		
84	75	NFC_P		
85	76	NFC_P_FE		
86	1	TABLE OF CONTENTS		
87	2	V59 HIER_WIFI_CG BOM TABLE AND IO PORTS		
88	3	2G4 rFEM [LAT]		
89	1	TITLE PAGE		
90	2	PORTS		
91	3	CONSTRAINTS		
92	4	FR1 LAT LB/2G SPAD		

Apple Proprietary and Confidential

DRAWING TITLE

SCH,MLB,CG

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Multi-Vendor Criticals

Capacitors

In descending order of value, then package size

PART NUMBER	COMMENT
138S0979	CAP,CER,X5R,10UF,20%,10V,0402,H=0.65MM
138S0692	CAP,CER,X5R,1UF,20%,6.3V,0201
138S00014	CAP,CER,X5R,1UF,20%,16V,0201,H=0.39MM
132S0245	CAP,CER,X5R,0.01UF,10%,6.3V,01005
132S00283	CAP,CER,X5R,6800PF,10%,16V,01005
132S0396	CAP,CER,X5R,1000PF,10%,10V,01005
132S00258	CAP,CER,X7R,330PF,10%,16V,01005
131S00543	CAP,CER,C0G,220PF,5%,25V,01005
131S00057	CAP,CER,NPO/C0G,100PF,5%,35V,01005
131S00150	CAP,CER,NPO/C0G,100PF,5%,25V,01005
131S00170	CAP,CER,C0G,220PF,5%,25V,01005
131S00293	CAP,CER,NPO/C0G,12PF,5%,16V,01005
131S00353	CAP,CER,NPO/C0G,10PF,5%,16V,01005
138S0758	CAP,CER,X5R,22UF,20%,10V,0603
131S00740	CAP,CER,NP0/C0G,47PF,5%,16V,01005
131S00732	CAP,CER,NPO/C0G,18PF,5%,16V,01005
132S00051	CAP,X7R,330PF,10%,25V,0201
131S00731	CAP,CER,NPO/C0G,56PF,5%,25V,01005
132S00270	CAP,CER,0.22UF,20%,10V,X5R,0201
131S00742	CAP,CER,NPO/C0G,33PF,5%,16V,01005

MLCCs

22uF, 0704

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00453	138S00296	ALL	CAP,X5R,22UF,20%,16V,KYO,H=0.8MM,0704

Primary: Murata
Kyocera

16uF, 0402, 4V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00484	138S00313	ALL	CAP,X5R,16UF,20%,4V,T,0402
138S00314	138S00313	ALL	CAP,X5R,16UF,20%,4V,M,0402
138S00315	138S00313	ALL	CAP,X5R,16UF,20%,4V,M,0402

Primary: Murata
Taiyo
Kyocera
Samsung

15uF, 0402

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00048	138S00003	(C4090-C4092,C4390,C6272,C6591,C7097,C7511_S,C9302-C9305)	0402,15uF,6.3V, Kyocera
138S00406	138S00003		0402,13uF,6.3V, Murata Gen2
138S00388	138S00003		0402,9uF,6.3V, Samco Gen2

Primary: Murata
Kyocera
Gen2: Murata
Gen2: Samsung

14uF, 0402

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00148	138S00149	ALL	0402-3T,10.5uF@1V, Kyocera
138S00150	138S00149	ALL	0402-3T,10.5uF@1V, SEMCO
138S00151	138S00149		0402-3T,10.5uF@1V, TY

Primary: Murata
Kyocera
Samsung
Taiyo

13uF, 0402, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00405	138S00406	ALL	CAP,X5R,13UF,20%,6.3V,4.9UF@3V,K,0402
138S00388	138S00406	ALL	CAP,X5R,9UF,20%,6.3V,4.9@3V,SAM,0402

Primary: Murata
Kyocera
Samsung

PART NUMBER	COMMENT
138S00313	CAP,CER,X5R,16UF,20%,4V,0402
138S00406	CAP,X5R,13UF,20%,6.3V,4.9UF@3V,M,0402
138S00149	0402-3T,10.5uF@1V
138S00003	0402,15uF,6.3V
138S00296	CAP,CER,X5R,22UF,20%,16V,0402,H=0.8MM

Capacitor Alternates

4.7uF, 0402

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S1103	138S0719	ALL	CAP,CER,X5R,4.7UF,20%,10V,0402

PART NUMBER	COMMENT
138S0719	0402,4.7uF,10V

4.7uF, 0402

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00215	138S1068	ALL	CAP,X5R,4.7UF,20%,16V,0402,H=0.55MM,TY

PART NUMBER	COMMENT
138S1068	CAP,CER,X5R,4.7UF,20%,16V,0402,H=0.55MM

4.2uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00518	138S0968	ALL	CAP,CER,X5R,4.2UF,10%,16V,K,0402H0.55,KYOCERA
138S00513	138S0968	ALL	CAP,CER,X5R,4.2UF,10%,16V,S,0402,H0.55,SEMCO

PART NUMBER	COMMENT
138S0968	CAP,CER,X5R,4.2UF,10%,16V,0402,H=0.55MM

4uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	COMMENT
138S00117	138S00071	CAP,X5R,4UF,0201,0.55MM,KYOCERA
138S00116	138S00071	CAP,X5R,4UF,0201,0.55MM,TAIYO
138S00515	138S00071	CAP,X5R,4UF,0201,0.55MM,SEMCO

PART NUMBER	COMMENT
138S00071	0201,X5R,4UF,0201,0.55MM,MURATA

3uF @ 1V, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00138	138S00139	ALL	0201,3uF@1V,KYOCERA
138S00164	138S00139	ALL	0201,3uF@1V,TAIYO
138S00280	138S00139	ALL	0201,3uF@1V,SAMSUNG

PART NUMBER	COMMENT
138S00139	0201,3uF@1V

3uF @ 1V, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00455	138S00441	ALL	CAP,X5R,4.9UF,20%,4V,3UF@1V,0201H.55,HZT
138S00443	138S00441	ALL	CAP,X5R,4.7UF,20%,4V,3UF@1V,0201H.55,HZT
138S00486	138S00441	ALL	CAP,X5R,4.4UF,20%,4V,3UF@1V,0201H.55

PART NUMBER	COMMENT
138S00441	CAP,X5R,4.3UF,20%,4V,3UF@1V,0201H.55,HZT

3.9uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00439	138S00444	ALL	CAP,X5R,4.3UF,20%,6.3V,1.48@3V,0201H.55
138S00440	138S00444	ALL	CAP,X5R,2.5UF,20%,6.3V,1.48@3V,0201H.55

PART NUMBER	COMMENT
138S00444	CAP,X5R,3.9UF,20%,6.3V,1.48@3V,0201H.55

2.2uF, 0201, 10V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00284	138S00136	ALL	CAP,X5R,2.2UF,20%,10V,0.39MM,0201,KYO

PART NUMBER	COMMENT
138S00136	CAP,X5R,2.2UF,20%,10V,MUR,H=0.39,0201

2.2uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00049	138S00450	(C2170-C2173,C3590,C5392)	CAP,CER,X5R,2.2UF,20%,6.3V,0201
138S0831	138S00450	(C2170-C2173,C3590,C5392)	CAP,CER,X5R,2.2UF,20%,6.3V,0201
138S00516	138S00450	(C2170-C2173,C3590,C5392)	CAP,X5R,2.2UF,20%,6.3V,S,HZ0201

PART NUMBER	COMMENT
138S00450	CAP,CER,X5R,2.2UF,20%,6.3V,0201

1uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S0739	138S0706	ALL	CAP,CER,X5R,1UF,20%,10V,0201,SAMSUNG
138S0945	138S0706	ALL	CAP,CER,X5R,1UF,20%,10V,0201,KYOCERA
138S00517	138S00014	ALL	CAP,X5R,1UF,20%,16V,0201,H=0.39MM,KYOCERA
138S00085	138S00014	ALL	CAP,X5R,1UF,20%,16V,0201,H=0.39MM,MURATA

PART NUMBER	COMMENT
138S0706	CAP,X5R,1UF,20%,10V,0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S0639	132S00088	ALL	CAP,CER,X5R,0.47UF,20%,25V,0201,Murata

PART NUMBER	COMMENT
132S00088	CAP,X5R,0.47UF,20%,25V,0201,Taiyo

1000pF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
131S00329	131S00025	ALL	CAP,C0G,1000PF,2%,25V,TAIYO,0201

PART NUMBER	COMMENT
131S00025	CAP,C0G,1000PF,2%,25V,0201

0.47uF, 01005

All RefDes in ( ) are dual-sourced from Murata and Taiyo

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00128	138S00412	ALL	CAP,CER,X5R,0.47UF,20%,6.3V,KYO,01005
138S00519	138S00412		CAP,X5R,0.47UF,20%,6.3V,0.09@3V,S,01005

PART NUMBER	COMMENT
138S00412	CAP,X5R,0.47UF,20%,6.3V,MUR,01005

0.22uF, 01005

RefDes field intentionally left blank to allow selective single-sourcing

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00380	132S00014		01005,0.22uF,6.3V,Taiyo
132S00304	132S00014	(C2800-C2805,C2810,C2811)	01005,0.22uF,6.3V,Kyocera

PART NUMBER	COMMENT
132S00014	01005,0.22uF, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00199	132S00200	ALL	CAP,CER,X5R,0.1UF,20%,10V,01005,Murata
132S00204	132S00200	ALL	CAP,CER,X5R,0.1UF,20%,10V,01005,Kyocera

PART NUMBER	COMMENT
132S00200	01005,0.1uF,10V,Taiyo

0.1uF, 01005, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00185	132S0316	(C2806-C2809,C5228-C5231)	CAP,CER,X5R,0.1UF,20%,6.3V,01005
132S00350	132S0316		CAP,CER,X5R,0.1UF,20%,6.3V,01005

PART NUMBER	COMMENT
132S0316	01005,0.1uF, 6.3V

0.1uF, 01005, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00154	132S0683	ALL	CAP,CER,X5R,0.1UF,10%,6.3V,01005

PART NUMBER	COMMENT
132S0683	CAP,CER,X5R,0.1UF,10%,6.3V,01005

8.2nF, 01005, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	COMMENT
132S00381	132S00377	CAP,CER,X5R,8200PF,10%,6.3V,01005

PART NUMBER	COMMENT
132S00377	CAP,CER,X5R,8200PF,10%,6.3V,01005

2.2nF, 01005

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00308	132S0420	ALL	CAP,X5R,2200PF,10%,16V,01005,Kyocera
132S00264	132S0420		CAP,CER,X5R,2200PF,10%,16V,01005

PART NUMBER	COMMENT
132S0420	CAP,X5R,2200PF,10%,16V,01005,Taiyo

Apple Proprietary and Confidential

PAGE TITLE
SYSTEM: BOM Tables (1/2) (2)

Apple Inc.

DRAWING NUMBER

SIZE D

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Additional Capacitor Alternates

0.1uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00229	132S00010	ALL	CAP,CER,X5R,0.1UF,10%,35V,0201

PART NUMBER	COMMENT
132S00010	CAP,CER,X5R,0.1UF,10%,35V,0201

33nF, 0402

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00319	132S00314	ALL	CAP,CER,33NF,10%,50V,X7R,H=0.55,M,0402

PART NUMBER	COMMENT
132S00314	CAP,CER,33NF,10%,50V,X7R,H=0.55,M,0402

Level Shifter Alternates

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
311S00231	311S00232	ALL	IC,74AVC2T45,XCVR,2 BIT,2 SPLY,X2SON8
311S00230	311S00212	ALL	IC,74AVC1T45,XCVR,1 BIT,2 SPLY,X2SON6
311S00261	311S00233	ALL	IC,LSF0101,XCVR,2 BIT,2 SPLY,X2SON6
311S00348	311S00235	ALL	IC,SGM4542V,XCVR,2 BIT,2 SPLY,BIDI,DFN8

PART NUMBER	COMMENT
311S00232	IC,74AVC2T45,XCVR,2 BIT,2 SPLY,X2SON8
311S00212	IC,74AVC1T45,XCVR,1 BIT,2 SPLY,X2SON6
311S00233	IC,LSF0101,XCVR,2 BIT,2 SPLY,X2SON6
311S00235	IC,NVT0202,XCVR,2 BIT,2 SPLY,BIDI,DFN8

ZRX Cap ALTs

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00187	138S00240	ALL	CAP,X5R,4.7UF,20%,25V,0402
138S00185	138S00246	ALL	CAP,X5R,2.2UF,20%,25V,0402

PART NUMBER	COMMENT
138S00240	CAP,X5R,4.7UF,20%,25V,0402
138S00246	CAP,X5R,2.2UF,20%,25V,0402

Power Inductor Alternates

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
152S01513	152S00897	ALL	IND,CPLD,0.1UH,20%,5.5A,20MO,2016
152S01771	152S00818	ALL	Taiyo,IND,MLD,0.22UH,20%,5.3A,40MO,H=0.65,1608
152S01563	152S00985	ALL	Taiyo,IND,MLD,0.47UH,4.0A,45MO,2012
152S01770	152S00982	ALL	Taiyo,IND,MLD,0.47UH,20%,2.9A,70MO,H=0.65,1608
152S00825	152S00823	ALL	Taiyo,IND,MLD,1UH,20%,3A,60MO,H=0.65,2016
152S00994	152S00987	ALL	Taiyo,IND,MLD,1.0UH,1.5A,67MO,H=0.65,2012
152S00869	152S00871	ALL	CYNTEC,IND,MLD,0.47UH,5.6A,30MO,H=0.8,2016
152S01578	152S01255	ALL	TAIYO,IND,PWR,0.47UH,3.8A,39MO,H=0.65,2016

PART NUMBER	COMMENT
152S00897	Taiyo,IND
152S00818	Cyntec,IND
152S00985	Cyntec,IND
152S00982	Cyntec,IND
152S00823	Cyntec,IND
152S00987	Cyntec,IND

Misc. Alternates

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
155S00194	155S00400	ALL	FERR BD,150OHM,25%,200MA,0.7OHM DCR,01005
155S00414	155S0876	ALL	FERR BD,10OHM,50%,1.1A,0.05OHM DCR,01005
155S00131	155S0755	ALL	FERR BD,240OHM,25%,200MA,1.0OHM DCR,01005
155S00583	155S00140	ALL	FERR BD,33OHM,25%,400MA,0.20DCR,01005
377S00070	377S00001	ALL	TVS,BIDIR,5.8V,6PF,01005
377S00140	377S00001	ALL	TVS,BIDIR,5V,6PF,01005
107S00469	107S00349	ALL	THERMISTOR,NTC,10K OHM,1%,B=3380K,01005

PART NUMBER	COMMENT
155S00400	FERR BD,150OHM,25%,200MA,0.7OHM DCR,01005
155S0876	FERR BD,10OHM,50%,1.1A,0.05OHM DCR,01005
155S0755	FERR BD,240 OHM,25%,200MA,1.0 DCR,01005
155S00140	FERR BD,33OHM,25%,400MA,0.20DCR,01005
377S00001	TVS,BIDIR,5.8V,6PF,01005
107S00349	THERMISTOR,NTC,10K OHM,1%,B=3435,01005

Display Choke Alternates

ALTERNATE PART NO.	PRIMARY PART NO.	COMMENT
155S0577	155S0960	FERR BD,70 OHM,25%,300MA,0.45 DCR,01005

PART NUMBER	COMMENT
155S0960	FERR BD,70 OHM,25%,300MA,0.4 DCR,01005

Apple Proprietary and Confidential

PAGE TITLE
SYSTEM: BOM Tables (2/2) (3)

Apple Inc.

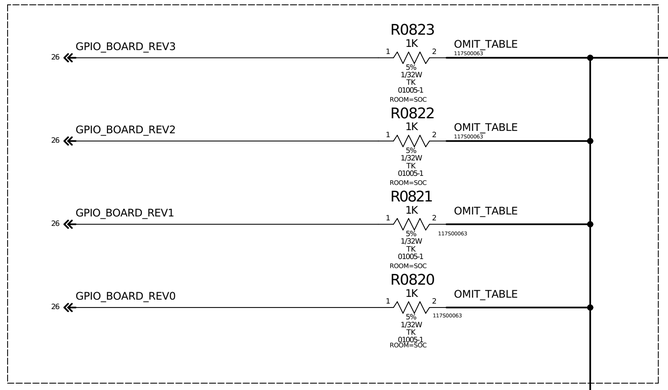
DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

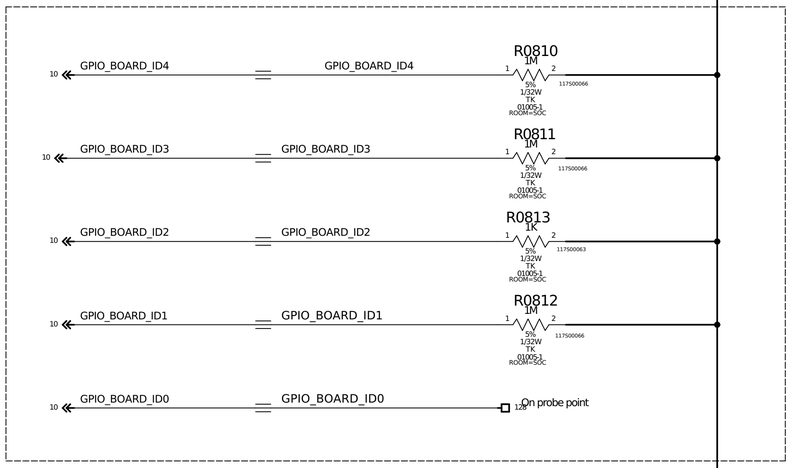
BOOTSTRAPPING

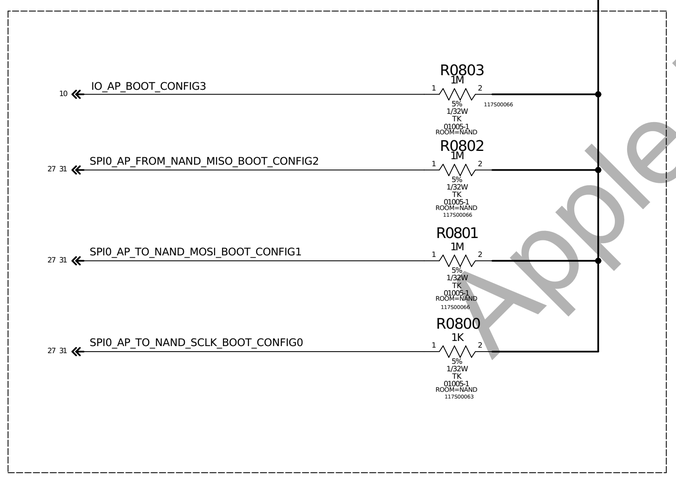
BOARD REV + BOARD ID + BOOT CONFIG



PP1V24_IO_SOC_S0

24 39 103





Board Rev [3:0]

* Float = 0 | PU = 1

Note: iBoot uses the inverse of BOARD_REV[3:0], so that it counts up (Proto0 = 0x0, PVT = 0xF)

		R0823	R0822	R0821	R0820
?	BOARD_REV[3:0]	[3]	[2]	[1]	[0]
P0	4'b1111	1	1	1	1
P1	4'b1110	1	1	1	0
(Spare)	4'b1101	1	1	0	1
P2	4'b1011	1	0	1	1
(Spare)	4'b1010	1	0	1	0
EVT	4'b0111	0	1	1	1
(Spare)	4'b0110	0	1	1	0
CRB	4'b0100	0	1	0	0
(Spare)	4'b0011	0	0	1	1
DVT	4'b0010	0	0	1	0
(Spare)	4'b0001	0	0	0	1
PVT	4'b0000	0	0	0	0

Board ID [4:0]

* Float = 0 | PU = 1

		R0810	R0811	R0813	R0812	
	BOARD_ID[4:0]	[4]	[3]	[2]	[1]	[0] 0=MLB, 1=DEV
MLB V59	5'b00100	0	0	1	0	0
DEV V59	5'b00101	0	0	1	0	1

Boot Config [2:0]

* Float = 0 | PU = 1

				R0803	R0802	R0801	R0800	
	USAGE	SPEED	TEST	[3]	[2]	[1]	[0]	
SPI0 NAND	--	12MHz	--	0	0	0	0	
SPI0 NAND	POR	40MHz	--	0	0	0	1	<-- POR
SPI1 QUAD-SPI NOR	--	24MHz	--	0	0	1	0	
SPI0 UNUSED	--	UNUSED	--	0	0	1	1	
SPI1 NOR	--	6MHz	--	0	1	0	0	
SPI1 NOR	--	12MHz	--	0	1	0	1	
SPI1 QUAD-SPI NOR	--	40MHz	--	0	1	1	0	
SPI1 NOR	--	40MHz	--	0	1	1	1	
SPI0 NAND	--	12MHz	Test	1	0	0	0	
SPI0 NAND	--	40MHz	Test	1	0	0	1	
SPI1 QUAD-SPI NOR	--	24MHz	Test	1	0	1	0	
SPI0 UNUSED	--	UNUSED	Test	1	0	1	1	
SPI1 NOR	--	6MHz	Test	1	1	0	0	
SPI1 NOR	--	12MHz	Test	1	1	0	1	
SPI1 QUAD-SPI NOR	--	40MHz	Test	1	1	1	0	
SPI1 NOR	--	40MHz	Test	1	1	1	1	

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	QTY	DESCRIPTION
117S00063	BOARD_REV:PROTO0	R0820-R0823	4	RES,TK,1K OHM,5%,1/32W,01005
117S00063	BOARD_REV:PROTO1	R0821-R0823	3	RES,TK,1K OHM,5%,1/32W,01005
117S00066	BOARD_REV:PROTO1	R0820	1	RES,TK,1M OHM,5%,1/32W,01005
117S00063	BOARD_REV:PROTO2	R0820,R0821,R0823	3	RES,TK,1K OHM,5%,1/32W,01005
117S00066	BOARD_REV:PROTO2	R0822	1	RES,TK,1M OHM,5%,1/32W,01005
117S00063	BOARD_REV:EVT	R0820-R0822	3	RES,TK,1K OHM,5%,1/32W,01005
117S00066	BOARD_REV:EVT	R0823	1	RES,TK,1M OHM,5%,1/32W,01005
117S00063	BOARD_REV:CRB	R0822	1	RES,TK,1K OHM,5%,1/32W,01005
117S00066	BOARD_REV:CRB	R0820,R0821,R0823	3	RES,TK,1M OHM,5%,1/32W,01005
117S00063	BOARD_REV:DVT	R0821	1	RES,TK,1K OHM,5%,1/32W,01005
117S00066	BOARD_REV:DVT	R0820,R0822,R0823	3	RES,TK,1M OHM,5%,1/32W,01005
117S00066	BOARD_REV:PVT	R0820-R0823	4	RES,TK,1M OHM,5%,1/32W,01005

Apple Proprietary and Confidential

PAGE TITLE

SYSTEM: Bootstrapping (8)

Apple Inc.

DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

TOP SIDE

ST_AP_NW_HNGRMNT
OMIT_TABLE
SM
HANGER-BOSS-SHIFT-MLB-D2Y
806-35144

SH_AP_N
SM
SHLD-MLB-CG-N-V59
806-47547

ST_AP_NW_CLIP
STIFFENER-MLB-DISP-D27
SM
806-33327

SH_AP_S
SM
SHLD-MLB-AP-S-BP-UF-V59
806-45364

ST_AP_SE_CLIP
STIFFENER-MLB-DISP-D27
SM
806-33327

860-02036
SB0900
STDOFF-2.5X3O1.4ID-0.76H-SM

BOTTOM SIDE

ST_AP_BOT_STIFFENER
STIFFENER-MLB-CG-BOT-V59
SM
806-47512

FD0900 FID 0P5SQ-CROSS-NSP 998-04808
FD0910 FID 0.75M0.5SQ-NSP 998-25640
FD0901 FID 0P5SQ-CROSS-NSP 998-04808
FD0911 FID 0.75M0.5SQ-NSP 998-25640
FD0902 FID 0P5SQ-CROSS-NSP 998-04808
FD0912 FID 0.75M0.5SQ-NSP 998-25640
FD0903 FID 0P5SQ-CROSS-NSP 998-04808
FD0915 FID 0.75M0.5SQ-NSP 998-25640
FD0905 FID 0P5SQ-CROSS-NSP 998-04808
FD0914 FID 0.75M0.5SQ-NSP 998-25640

MEMS UF Dam
132500030
C0900 0.1UF 0201 10V 10% X6S-CERM ROOM=PMU
C0901 0.1UF 0201 10V 10% X6S-CERM ROOM=PMU
C0902 0.1UF 0201 10V 10% X6S-CERM ROOM=PMU
C0903 0.1UF 0201 10V 10% X6S-CERM ROOM=PMU
C0904 0.1UF 0201 10V 10% X6S-CERM ROOM=PMU
C0905 0.1UF 0201 10V 10% X6S-CERM ROOM=PMU

UF

R0900 R0901 R0902 R0903 R0904 R0905 R0906 R0907 R0908 R0909
R0910 R0911 R0912 R0913 R0914 R0915 R0916 R0917 R0918
R0920 R0921 R0922 R0923 R0926 R0928
R0930 R0931 R0936 R0937 R0939
NOSTUFF
R0940 R0941 R0943 R0945 R0948 R0949
R0950 R0951 R0953 R0954 R0955 R0956 R0958 R0959
R0960 R0961 R0963 R0964 R0965 R0967 R0969
R0975 R0976 R0977

All: 0 0% 1/32W TK 1005 ROOM=DFM 117500067 (NOSTUFF on R0940)

PAGE TITLE
SYSTEM: Mechanical (9)

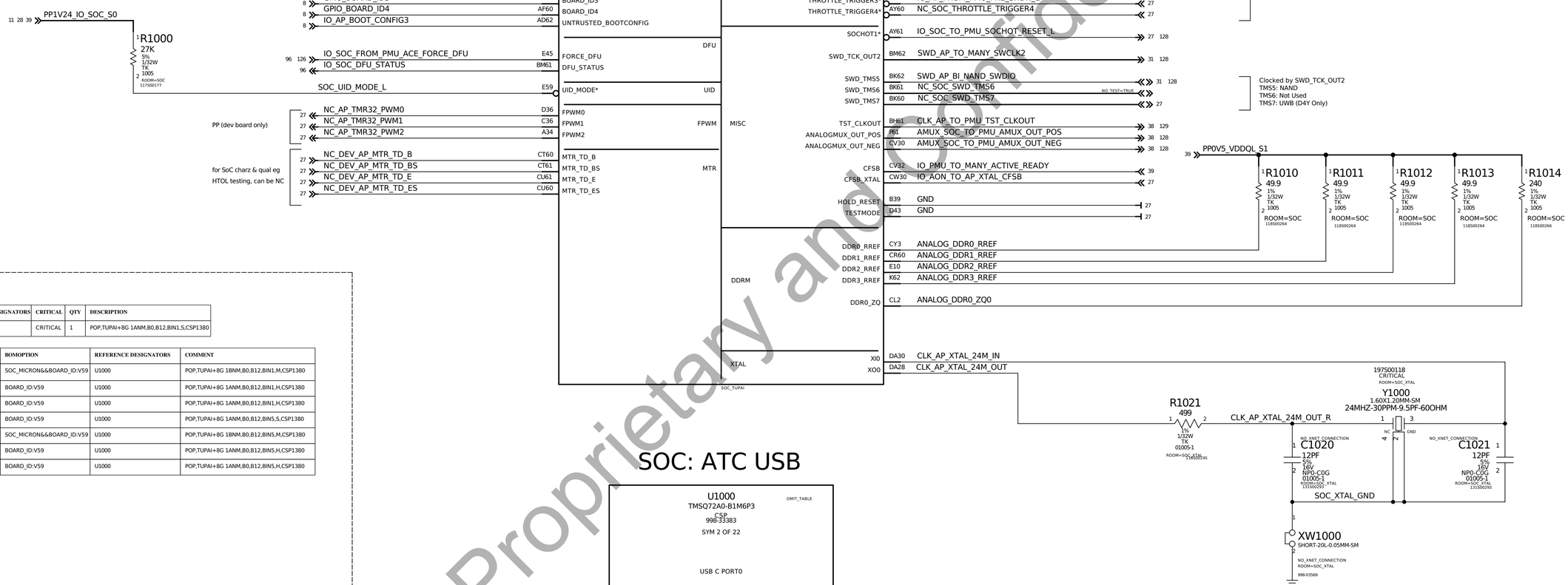
Apple Inc.

DRAWING NUMBER
SIZE

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: Misc

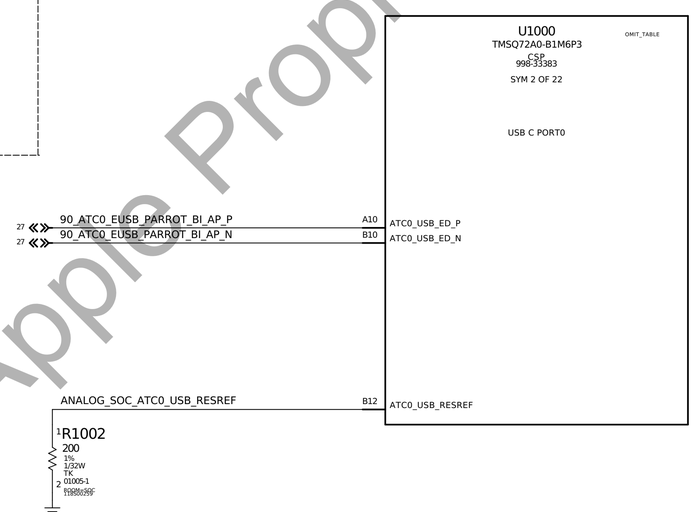


SOC APNs

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
339S01609	BOARD_ID:V59	U1000	CRITICAL	1	POP,TUPAI+8G 1ANM,B0,B12,BIN1,S,CSP1380

ALTERNATE PART NO.	PRIMARY PART NO.	BOMOPTION	REFERENCE DESIGNATORS	COMMENT
339S01602	339S01609	SOC_MICRON&&BOARD_ID:V59	U1000	POP,TUPAI+8G 1BNM,B0,B12,BIN1,M,CSP1380
339S01603	339S01609	BOARD_ID:V59	U1000	POP,TUPAI+8G 1ANM,B0,B12,BIN1,H,CSP1380
339S01604	339S01609	BOARD_ID:V59	U1000	POP,TUPAI+8G 1ANM,B0,B12,BIN1,H,CSP1380
339S01605	339S01609	BOARD_ID:V59	U1000	POP,TUPAI+8G 1ANM,B0,B12,BIN5,S,CSP1380
339S01606	339S01609	SOC_MICRON&&BOARD_ID:V59	U1000	POP,TUPAI+8G 1BNM,B0,B12,BIN5,M,CSP1380
339S01607	339S01609	BOARD_ID:V59	U1000	POP,TUPAI+8G 1ANM,B0,B12,BIN5,H,CSP1380
339S01608	339S01609	BOARD_ID:V59	U1000	POP,TUPAI+8G 1ANM,B0,B12,BIN5,H,CSP1380

SOC: ATC USB



Apple Proprietary and Confidential

PAGE TITLE
SOC: USB & Misc (10)

Apple Inc.

DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: PCIE & NAND

V59 WiFi PCIE is GEN2

PCIE GEN4 - LINK 0
ALIASES RESOLVED ON CSA 27

PCIE GEN4 - LINK 1
ALIASES RESOLVED ON CSA 27

PCIE GEN4 - ST LINK 0

PP1V24_IO_SOC_S0
10 11 28 39
R1102
27K
5%
1/32W
TK
1005
ROOM=SOC
PACK_OPTION=D4Y_DEV
PACK_IGNORE=TRUE
117500177

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 3 OF 22
OMIT_TABLE

PCIE_GP0_AP_BI_WLAN_CLKREQ_L — AD61 GP_PCIE_CLKREQ0*
90_PCIE_GP0_AP_FROM_WLAN_C_RX_P — DA19 GP_PCIE_RX0_P
90_PCIE_GP0_AP_FROM_WLAN_C_RX_N — DA17 GP_PCIE_RX0_N
90_PCIE_GP0_AP_TO_WLAN_C_TX_P — CW15 GP_PCIE_TX0_P
90_PCIE_GP0_AP_TO_WLAN_C_TX_N — CY15 GP_PCIE_TX0_N
PCIE_GP0_AP_TO_WLAN_PERST_L — V62 GP_PCIE_PERST0*
LINK0

PCIE_GP1_AP_BI_BB_CLKREQ_L — Y60 GP_PCIE_CLKREQ1*
90_PCIE_GP1_AP_FROM_BB_C_RX_P — DA13 GP_PCIE_RX1_P
90_PCIE_GP1_AP_FROM_BB_C_RX_N — DA12 GP_PCIE_RX1_N
90_PCIE_GP1_AP_TO_BB_C_TX_P — CW10 GP_PCIE_TX1_P
90_PCIE_GP1_AP_TO_BB_C_TX_N — CY10 GP_PCIE_TX1_N
LINK1
PCIE_GP1_AP_TO_BB_PERST_L — T62 GP_PCIE_PERST1*

90_PCIE_GP0_AP_TO_WLAN_REFCLK_P — CV17 GP_PCIE_REF_CLK0_P
90_PCIE_GP0_AP_TO_WLAN_REFCLK_N — CV19 GP_PCIE_REF_CLK0_N
90_PCIE_GP1_AP_TO_BB_REFCLK_P — CV13 GP_PCIE_REF_CLK1_P
90_PCIE_GP1_AP_TO_BB_REFCLK_N — CV12 GP_PCIE_REF_CLK1_N
PCIE REFCLKS

90_PCIE_ST0_AP_TO_NAND_REFCLK_P — CV25 ST_PCIE_REF_CLK0_P
90_PCIE_ST0_AP_TO_NAND_REFCLK_N — CV23 ST_PCIE_REF_CLK0_N

ANALOG_PCIE_RCAL_POS — CU10 PCIE_RCAL_P
ANALOG_PCIE_RCAL_NEG — CU12 PCIE_RCAL_N
R1140 200 1% 1/32W TK 01005-1 ROOM=SOC 118500259
C1140 10PF 5% 16V NP0/C0G 1005 ROOM=SOC 131500353

ST_PCIE_CLKREQ0* — BD60
PP1V24_IO_SOC_S0
R1100 27K 5% 1/32W TK 1005 ROOM=SOC 117500177
PCIE_ST0_AP_BI_NAND_CLKREQ_L

ST_PCIE_RX0_P — DA25 90_PCIE_ST0_AP_FROM_NAND_C_RX_P
ST_PCIE_RX0_N — DA23 90_PCIE_ST0_AP_FROM_NAND_C_RX_N
NAND

ST_PCIE_TX0_P — CW21 90_PCIE_ST0_AP_TO_NAND_C_TX_P
ST_PCIE_TX0_N — CY21 90_PCIE_ST0_AP_TO_NAND_C_TX_N

ST_PCIE_PERST0* — BB61 PCIE_ST0_AP_TO_NAND_PERST_L
R1101 47K 5% 1/32W TK 01005-1 ROOM=SOC 117500068

NAND_SYS_CLK — BD61 CLK_AP_TO_NAND_24M_R
R1103 33.2 1% 1/32W TK 01005-1 ROOM=SOC 118500261
CLK_AP_TO_NAND_24M

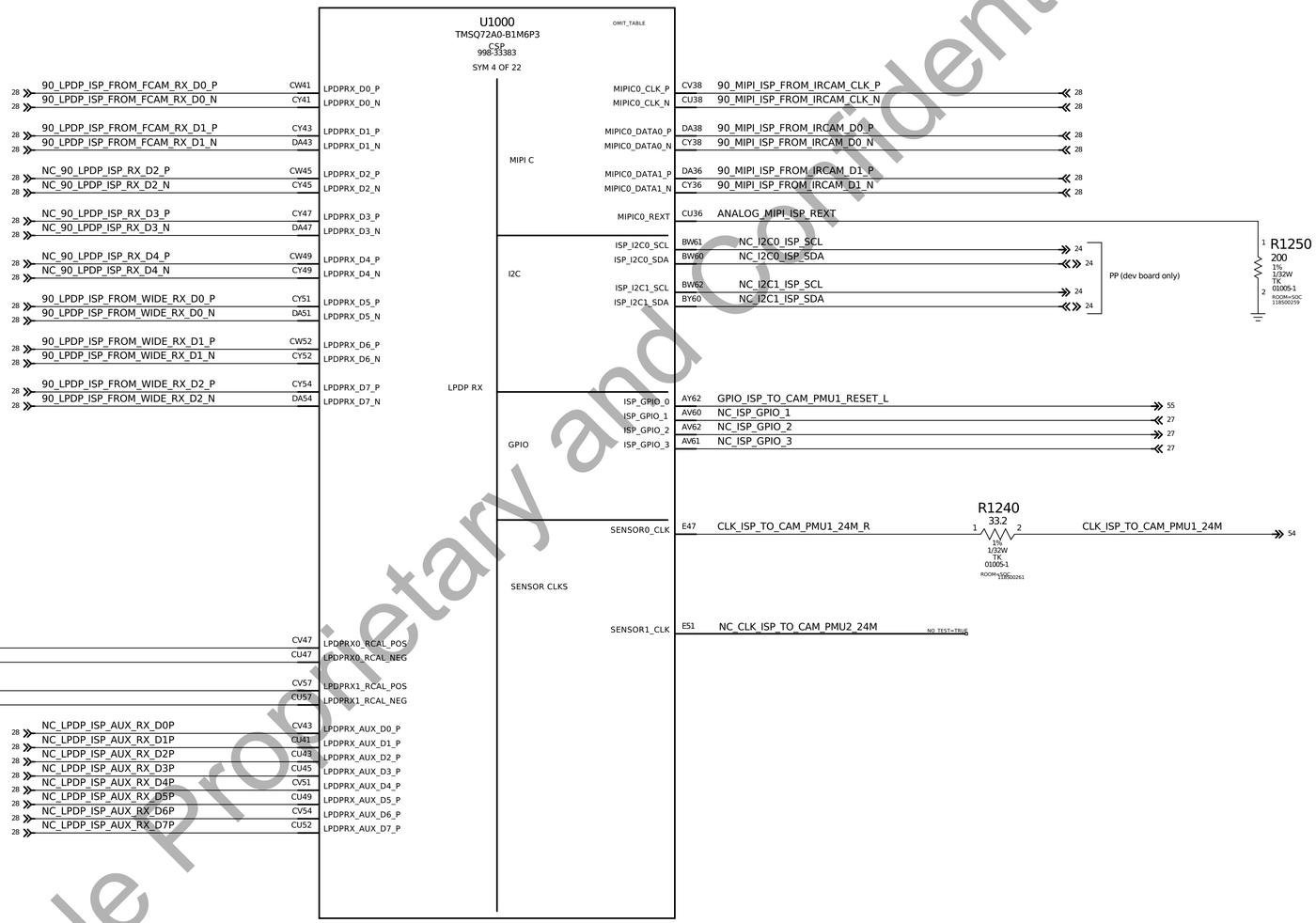
SSD_RESET* — BF60 IO_AP_TO_NAND_RESET_L
SSD_BFH — BF61 IO_AP_TO_NAND_BOOT_FROM_HOST_FW

Apple Proprietary and Confidential

PAGE TITLE: SOC: PCIE & NAND (11)
DRAWING NUMBER: D
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: ISP



Apple Proprietary and Confidential

PAGE TITLE

SOC: ISP (12)

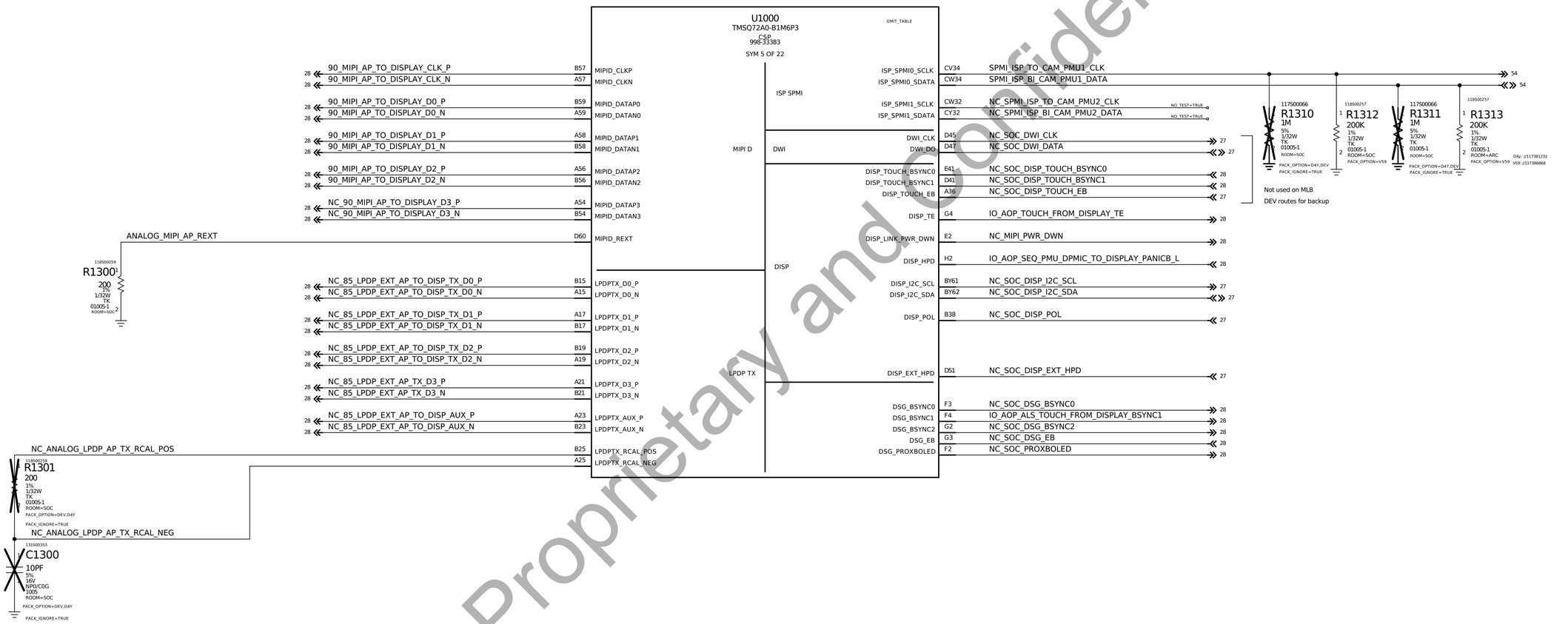
Apple Inc.

DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: DISPLAY/ISP



Apple Proprietary and Confidential

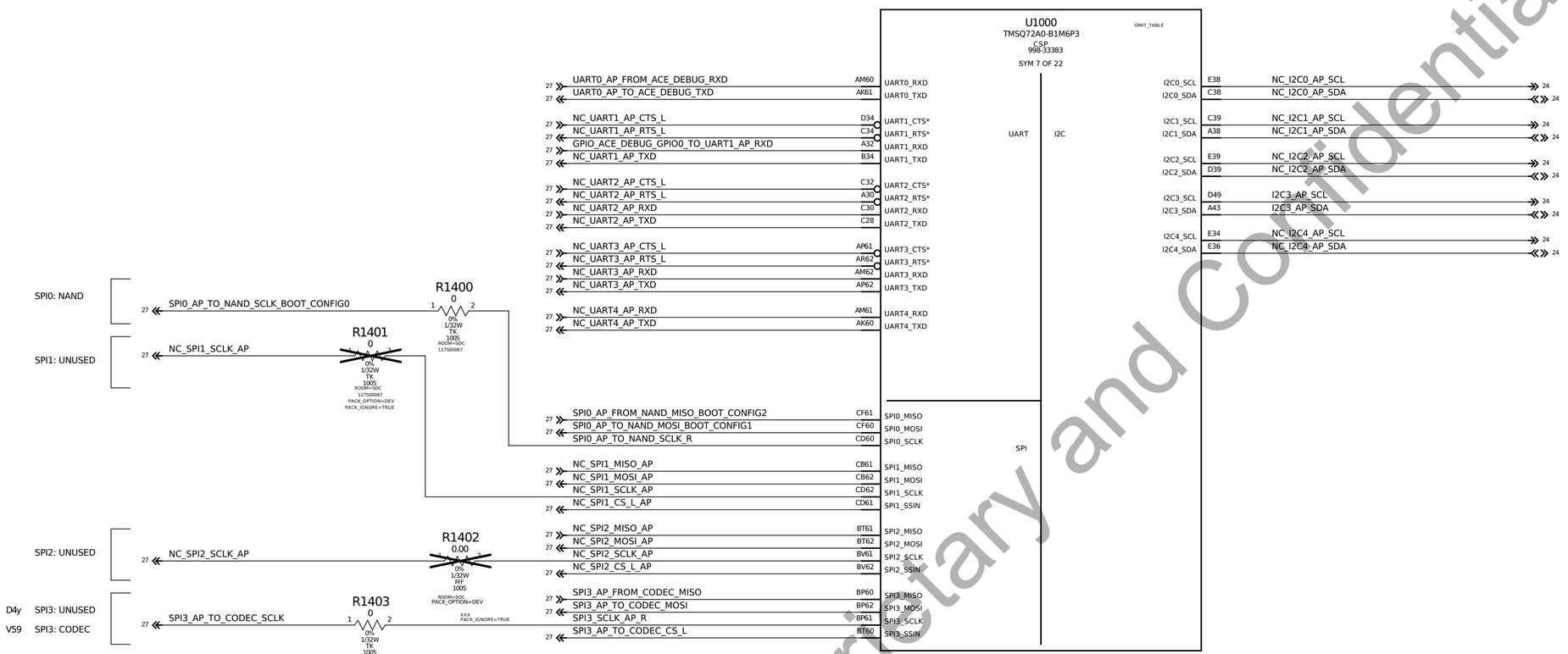
PAGE TITLE
SOC: Display/ISP (13)

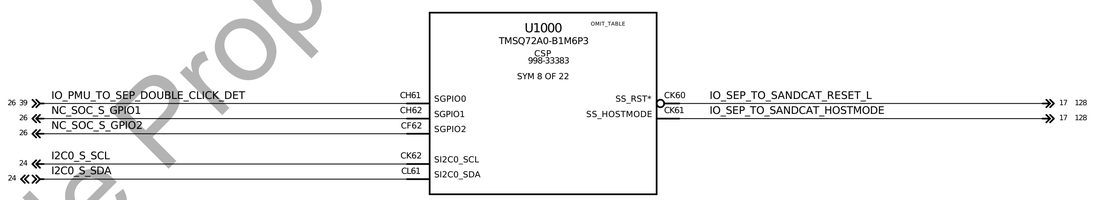
Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: AP Serial





AP SPI Map

BUS	DEVICE	MAX SPEED	LOCATION	
SPI0 AP	S5E	40MHz	MLB	
SPI1 AP	BONGO	24MHz	MLB	
SPI2 AP	UNUSED	N/A	N/A	
SPI3 AP	CODEC	24MHz	MLB	V59 Only

Apple Proprietary and Confidential

PAGE TITLE
SOC: Serial (14)

Apple Inc.

DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: AP GPIO

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 6 OF 22
OMIT_TABLE

26	GPIO_BOARD_REV3	AT61	GPIO[0]	GPIO[16]	D58	GPIO_AP_FROM_CODEC_INT_L
26	GPIO_BOARD_REV2	AR60	GPIO[1]	GPIO[17]	E57	GPIO_AP_TO_AMUX_PMU_SYNC
26	GPIO_BOARD_REV1	E52	GPIO[2]	GPIO[18]	E56	GPIO_AP_SOC_DC_CANARY1
26	GPIO_BOARD_REV0	B51	GPIO[3]	GPIO[19]	D56	NC_AP_GPIO19
26	GPIO_AP_INTERPOSER_CANARY10_AP_TO_A	D52	GPIO[4]	GPIO[20]	D54	GPIO_AP_SOC_DC_CANARY4
26	GPIO_AP_INTERPOSER_CANARY9_AP_TO_A	A49	GPIO[5]	GPIO[21]	B49	GPIO_AP_FROM_WLAN_TIME_SYNC
26	GPIO_AP_BI_ACE_SWDIO	AR61	GPIO[6]	GPIO[22]	B45	GPIO_AP_INTERPOSER_CANARY8_AP_TO_A
26	GPIO_AP_TO_ACE_SWCLK	AD60	GPIO[7]	GPIO[23]	A47	GPIO_AP_SOC_DC_CANARY3
26	GPIO_AP_INTERPOSER_CANARY11_AP_TO_A	AC62	GPIO[8]	GPIO[24]	G61	GPIO_AP_INTERPOSER_CANARY5_AP_TO_A
26	GPIO_AP_FROM_BT_AUDIO_SYNC	AC61	GPIO[9]	GPIO[25]	D59	NC_AP_GPIO25
26	GPIO_AP_FROM_ACE_DFU_BOOTED_L	AB62	GPIO[10]			
26	NC_AP_GPIO11	AB60	GPIO[11]			
26	GPIO_AP_SOC_DC_CANARY2	AB61	GPIO[12]			
26	GPIO_AP_INTERPOSER_CANARY6_AP_TO_A	Y62	GPIO[13]			
26	GPIO_AP_INTERPOSER_CANARY7_AP_TO_A	Y61	GPIO[14]			
26	NC_AP_GPIO15	G60	GPIO[15]			

SOC: SMC

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 10 OF 22
OMIT_TABLE

144	SPMI_A0_NUB_TO_ACE_CLK	K3	SMC_I2CM0_SCL
144	SPMI_A0_NUB_BI_ACE_DATA	H3	SMC_I2CM0_SDA
25	NC_I2C1_SMC_SCL	L2	SMC_I2CM1_SCL
25	NC_I2C1_SMC_SDA	L4	SMC_I2CM1_SDA
25	I2C2_SMC_SCL	K4	SMC_I2CM2_SCL
25	I2C2_SMC_SDA	K2	SMC_I2CM2_SDA

117500066 R1517 1M 5% 1/32W TK 01005-1 ROOM=SOC
117500066 R1516 1M 5% 1/32W TK 01005-1 ROOM=SOC

SOC: NUB & MTP

118500261 R1504 33.2 1% 1/32W TK 01005-1 ROOM=PMU
144 SPMI0_NUB_TO_PMU_CLK → SPMI0_NUB_TO_PMU_CLK_R

118500261 R1510 33.2 1% 1/32W TK 01005-1 ROOM=SOC
44 SPMI1_NUB_TO_WLCHGR_CLK → SPMI1_NUB_TO_WLCHGR_CLK_R

Clocked by SWD_TCK_OUT0
TMS0: PMU
TMS1: Touch
TMS2: Wireless Charger
TMS3: NC

Clocked by SWD_TCK_OUT1 TMS4: BB

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 11 OF 22
OMIT_TABLE

		CP3	NUB_SPMI0_SCLK	SPMI	
144	SPMI0_NUB_BI_PMU_DATA	CU4	NUB_SPMI0_SDATA		
		CU3	NUB_SPMI1_SCLK		
44	SPMI1_NUB_BI_WLCHGR_DATA	CV4	NUB_SPMI1_SDATA		
39 117 144	SWD_NUB_TO_MANY_SWCLK0	CB3	NUB_SWD_TCK_OUT0	SWD	
504	SWD_NUB_TO_BB_SWCLK	BY4	NUB_SWD_TCK_OUT1		
128 144	SWD_NUB_BI_PMU_SWDIO	CF3	NUB_SWD_TMS0		
117	SWD_NUB_BI_TOUCH_SWDIO	CF2	NUB_SWD_TMS1		
128 144	SWD_NUB_BI_WLCHGR_SWDIO	CD2	NUB_SWD_TMS2		
	NC_NUB_SWD_TSM3 (NO_TEST=TRUE)	CD3	NUB_SWD_TMS3		
128 504	SWD_NUB_BI_BB_SWDIO	CB4	NUB_SWD_TMS4		
96	IO_NUB_FROM_ACE_DOCK_CONNECT	AT2	NUB_DOCK_CONNECT	DOCK	
128	SOC_NUB_DBGWRAP_TEST	CB2	NUB_DBGWRAP_TEST		
26	GPIO_NUB_FROM_BB_WDOG_L	CU2	NUB_SCM_IO[0]	SCMIO	
26	GPIO_NUB_TO_BB_FORCE_PWM	CT4	NUB_SCM_IO[1]		
26	NC_NUB_GPIO2	CT3	NUB_SCM_IO[2]		
26	NC_NUB_GPIO3	CT2	NUB_SCM_IO[3]		
26	GPIO_NUB_TO_BB_DEBUG_EN	CV3	NUB_SCM_IO[4]		
26	GPIO_BB_TO_NUB_GSM_TXBURST_IND	CP4	NUB_SCM_IO[5]		
26	NC_NUB_GPIO6	CM4	NUB_SCM_IO[6]		
26	NC_NUB_GPIO7	CP2	NUB_SCM_IO[7]		
26	GPIO_NUB_FROM_BANFF_B2B_DETECT_L	CM3	NUB_SCM_IO[8]		
26	NC_NUB_GPIO9	CM2	NUB_SCM_IO[9]		
26	NC_NUB_GPIO10	CL4	NUB_SCM_IO[10]		
26	GPIO_NUB_FROM_DISPLAY_PANEL_ID	CK3	NUB_SCM_IO[11]		
26	IO_BUTTON_RINGER_L	CK2	NUB_SCM_IO[12]		
26	GPIO_NUB_TO_TOUCH_RESET_L	CH4	NUB_SCM_IO[13]		
26	NC_NUB_GPIO14	CH3	NUB_SCM_IO[14]		
26	NC_NUB_GPIO15	CH2	NUB_SCM_IO[15]		
27	NC_DEV_SOC_NUB_CLK_OUT0	CF4	NUB_CLK_OUT0	CLKS	
27	SOC_NUB_CLK_OUT1	BY3	NUB_CLK_OUT1		
96 128	SWD_SOC_FROM_ACE_SWCLK	AT4	JTAG_TCK	JTAG	
96 128	SWD_SOC_BI_ACE_SWDIO	AP3	JTAG_TMS		
27	GND	AM2	JTAG_SEL		
27	NC_DEV_JTAG_TDI	AR3	JTAG_TDI		
27	NC_DEV_JTAG_TDO	AP2	JTAG_TDO		
27	NC_DEV_JTAG_TRST_L	AR4	JTAG_TRST*		
27	90_EUSB_DBG_PARROT_BI_AP_P	BD3	DBG_USB_ED_P	DEBUG USB	
27	90_EUSB_DBG_PARROT_BI_AP_N	BD4	DBG_USB_ED_N		
	ANALOG_DBG_USB_RESREF	BB4	DBG_USB_RESREF		
27	PP1V24_S2	AT3	DBG_PROBE_VALID	MISC	
	MLB: DBG_PROBE_VALID=1 DEV: STARDUST CONTROL WITH SWITCH OVERRIDE TO 0				
27	IO_PMU_TO_SYSTEM_RESET_L	CW4	LPS_IN_RESET*		
27	IO_PMU_TO_SYSTEM_RESET_L	AK2	COLD_RESET*		
27	IO_PMU_TO_SYSTEM_RESET_L	AH3	CFSB_AON		
27	CLK_PMU_TO_AOP_32K	AK3	RT_CLK32768		
36 128	IO_SOC_TO_PMU_WDOG_RESET_L	AM3	WDOG*		
36 128	IO_AON_TO_AP_XTAL_CFSB	AR2	AON_SLEEP1_RESET*		
27	NC_TP_SOC_KIS_REQUEST_DFU	BW3	KIS_TO_PMU_REQUEST_DFU	KIS	
27	NC_TP_SOC_KIS_RESET	BY2	KIS_TO_PMU_RESET		

	MTP_SPI0_MISO	AF4	SPI0_MTP_FROM_TOUCH_MISO	117	
SPI	MTP_SPI0_MOSI	AH2	SPI0_MTP_TO_TOUCH_MOSI	117	
	MTP_SPI0_SCLK	AM4	SPI0_MTP_TO_TOUCH_SCLK_R		SPI0_MTP_TO_TOUCH_SCLK 117
I2C	MTP_I2C0_SCL	AK4	NC_I2C0_MTP_SCL	25	
	MTP_I2C0_SDA	AF3	NC_I2C0_MTP_SDA	25	
MTP FUNCS	MTP_FUNC0	AD3	GPIO_MTP_FROM_TOUCH_INT0_L	26	
	MTP_FUNC1	AC3	IO_TOUCH_TO_MANY_SCAN_ACTIVE	26	
	MTP_FUNC2	AF2	NC_MTP_GPIO2	26	
	MTP_FUNC3	AD4	NC_MTP_GPIO3	26	
	MTP_FUNC4	AD2	SPI0_MTP_TO_TOUCH_CS_L	117 118	
MIC	MIC_DISABLE*	E3	NC_DEV_AP_MIC_DISABLE_L	27	
	MIC_DISABLE_WARN*	F1	NC_DEV_AP_MIC_DISABLE_WARN_L	27	

117500067 R1500 0 0% 1/32W TK 1005 ROOM=SOC

SPMI Address Map

	BUS	DEVICE	ADDR	LOCATION	MAX SPEED
HEB BUS	SPMI0 AOP	WLAN/BT	0xE	CG MLB	24 MHz
	SPMI0 AOP	NFC Primary	0x8	CG MLB	24 MHz
	SPMI0 AOP	NFC Fury	0xC	BG MLB	24 MHz
	SPMI0 AOP	BB	0xD	BG MLB	24 MHz
	SPMI0 AOP	UWB	0xF	CG MLB	24 MHz
COEX BUS	SPMI1 AOP	WLAN/BT	0xE	CG MLB	24 MHz
	SPMI1 AOP	UWB	0XF	CG MLB	24 MHz
	SPMI1 AOP	BB	0xD	BG MLB	24 MHz
	SPMI A0 NUB	Ace3 Lite	0xF/0xD (SMC)	CG MLB	12 MHz
	SPMI A0 NUB	Ace3 Lite	0xE/0xC (AP)	CG MLB	12 MHz
	SPMI0 NUB	Baku	0xF/0xE	CG MLB	24 MHz
		Baku - 0xF (Privileged), 0xE (Non-privileged)			
	SPMI1 NUB	Shamisen	0xC	BG MLB	24 MHz
	SPMI1 NUB	Stonehenge	0xF	CG MLB	24 MHz
	SPMI1 NUB	CHROMITE	0xE	CG MLB	24 MHz

MTP SPI Map

BUS	DEVICE	MAX SPEED	LOCATION
SPI0 MTP	Touch	12MHz	Display/Touch Flex

1 R1550 200 1% 1/32W TK 01005-1 ROOM=SOC 118500259

Apple Proprietary and Confidential

PAGE TITLE
SOC: GPIO & SMC & MTP & NUB (15)

Apple Inc.

DRAWING NUMBER
SIZE

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: AOP

AOP I2S0
TopSpk, BotSpk

AOP I2S1
LP MIC

AOP I2S2
HP MIC

AOP I2S3
Arc, Hall, Flicker Det

AOP I2S4
Spare

AOP I2S5
Spare

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 9 OF 22

OMIT_TABLE

SCM
I2C
I2S
SPI
SPMI/UART

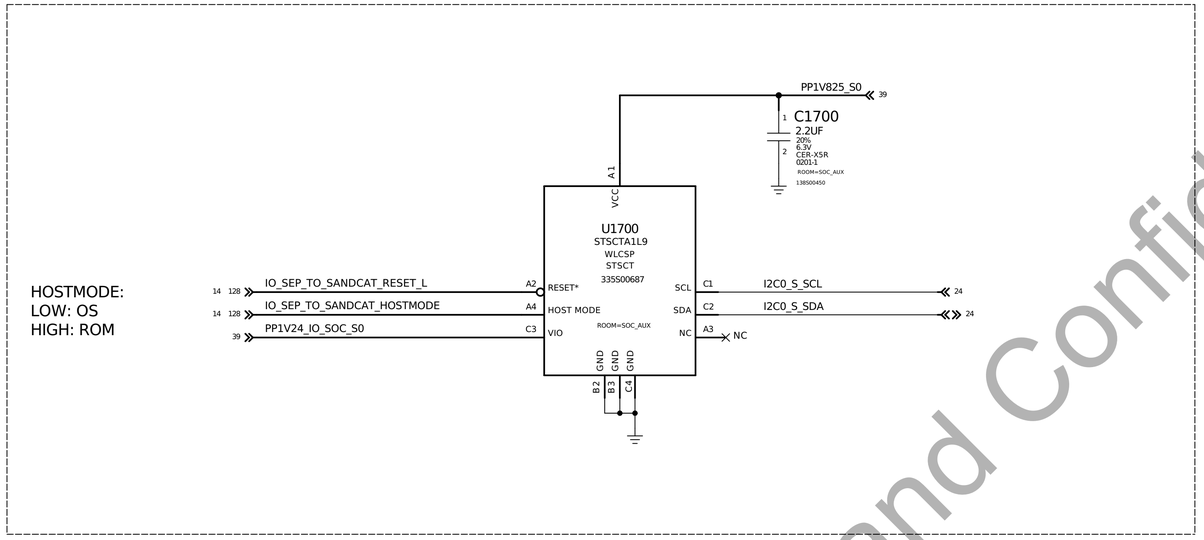
Note: AOP1
D4y: UWB
V59: GNSS

Apple Proprietary and Confidential

PAGE TITLE	DRAWING NUMBER	SIZE
SOC: AOP (16)		
Apple Inc.		

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED



AWL EEPROM REMOVED

Apple Proprietary and Confidential

PAGE TITLE
SOC: Extra Memory (17)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

4uF 0201 Capacitors (single-source Murata)

RefDes in () are singled-sourced from Murata

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00116	138S00071	(C1831,C1832)	CAP,X5R,4UF,0201,0.55MM,TAIYO
138S00117	138S00071	(C1831,C1832)	CAP,X5R,4UF,0201,0.55MM,KYOCERA
138S00515	138S00071	(C1831,C1832)	CAP,X5R,4UF,0201,0.55MM,SEMCO

SOC: CPU/GPU

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 12 OF 22
CPU/GPU
OMIT_TABLE

PP_CPU_PCORE_S0 (39)

C1800 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1806 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1807 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1802 14UF 20% 4V X5R 0402-D2X-1 ROOM=SOC_FILT
C1803 14UF 20% 4V X5R 0402-D2X-1 ROOM=SOC_FILT
138S00149 PACK_OPTION=VS9
138S00149

C1804 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT
C1805 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT
C1801 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1823 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT PACK_OPTION=D4Y PACK_IGNORE=TRUE
C1822 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT PACK_OPTION=D4Y PACK_IGNORE=TRUE
C1821 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT PACK_OPTION=D4Y PACK_IGNORE=TRUE

AL46	VDD_PCPU	
AN48	VDD_PCPU	
AN53	VDD_PCPU	
AR46	VDD_PCPU	
AU55	VDD_PCPU	
AW42	VDD_PCPU	
AW44	VDD_PCPU	
AW46	VDD_PCPU	
BA44	VDD_PCPU	
BC42	VDD_PCPU	
BC46	VDD_PCPU	
BC50	VDD_PCPU	
BE40	VDD_PCPU	
BE44	VDD_PCPU	
BE48	VDD_PCPU	
BE53	VDD_PCPU	
BG42	VDD_PCPU	
BG46	VDD_PCPU	
BG55	VDD_PCPU	
BJ40	VDD_PCPU	
BJ44	VDD_PCPU	
BL37	VDD_PCPU	
BL42	VDD_PCPU	
BR33	VDD_PCPU	
BU31	VDD_PCPU	
BU48	VDD_PCPU	
BW33	VDD_PCPU	
CA31	VDD_PCPU	
CA48	VDD_PCPU	
CC33	VDD_PCPU	
CE31	VDD_PCPU	
CE35	VDD_PCPU	
CE40	VDD_PCPU	
CE44	VDD_PCPU	
CE48	VDD_PCPU	
CE29	VDD_PCPU_SENSE	ANALOG_PCPU_SENSE_P (126)
CC31	VSS_PCPU_SENSE	ANALOG_PCPU_SENSE_N (126)
BE35	VDD_PCPU_ABSMIN	NC_ANALOG_PCPU_ABSMIN (27)

PP_CPU_ECORE_S0 (39)

C1895 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1896 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1891 14UF 20% 4V X5R 0402-D2X-1 ROOM=SOC_FILT
C1892 14UF 20% 4V X5R 0402-D2X-1 ROOM=SOC_FILT
138S00149
138S00149
C1898 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1897 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1899 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT

AN22	VDD_ECPU	
AN27	VDD_ECPU	
AR24	VDD_ECPU	
AR29	VDD_ECPU	
AR33	VDD_ECPU	
AR37	VDD_ECPU	
AU31	VDD_ECPU	
AU35	VDD_ECPU	
BA27	VDD_ECPU	
BC24	VDD_ECPU	
BE27	VDD_ECPU	
BE31	VDD_ECPU	
BG24	VDD_ECPU	
BG33	VDD_ECPU	
BC22	VDD_ECPU_SENSE	ANALOG_ECPU_SENSE_SE (126)

AA27	VDD_GPU	
AA35	VDD_GPU	
AA44	VDD_GPU	
AC20	VDD_GPU	
AC24	VDD_GPU	
AC29	VDD_GPU	
AC33	VDD_GPU	
AC42	VDD_GPU	
AC46	VDD_GPU	
AC50	VDD_GPU	
AE22	VDD_GPU	
AE48	VDD_GPU	
J14	VDD_GPU	
J22	VDD_GPU	
J31	VDD_GPU	
J40	VDD_GPU	
J48	VDD_GPU	
L11	VDD_GPU	
L16	VDD_GPU	
L20	VDD_GPU	
L24	VDD_GPU	
L29	VDD_GPU	
L33	VDD_GPU	
L42	VDD_GPU	
L46	VDD_GPU	
N18	VDD_GPU	
N35	VDD_GPU	
N44	VDD_GPU	
R11	VDD_GPU	
R16	VDD_GPU	
R20	VDD_GPU	
R33	VDD_GPU	
R37	VDD_GPU	
R42	VDD_GPU	
R46	VDD_GPU	
R50	VDD_GPU	
U14	VDD_GPU	
U40	VDD_GPU	
U48	VDD_GPU	
W20	VDD_GPU	
W24	VDD_GPU	
W29	VDD_GPU	
W33	VDD_GPU	
W37	VDD_GPU	
W42	VDD_GPU	
W46	VDD_GPU	
W50	VDD_GPU	
U22	VDD_GPU_SENSE	ANALOG_GPU_SENSE_P (126)
U20	VSS_GPU_SENSE	ANALOG_GPU_SENSE_N (126)

PP_GPU_S0 (39)

C1831 4UF 20% 6.3V CER-X5R 201 ROOM=SOC_FILT
C1832 4UF 20% 6.3V CER-X5R 201 ROOM=SOC_FILT
C1833 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1834 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1840 4.3UF 20% 4V X5R 201 ROOM=SOC_FILT 138S00441
C1841 4.3UF 20% 4V X5R 201 ROOM=SOC_FILT 138S00441
C1835 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1836 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1837 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1838 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1830 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1839 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT PACK_OPTION=D4Y PACK_IGNORE=TRUE

SOC: SOC

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 13 OF 22
SOC
OMIT_TABLE

PP_SOC_S1P5 (18 39)

C1860 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT 138S00450
C1861 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=SOC_FILT 138S00450
C1866 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1862 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1863 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1864 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT
C1865 16UF 20% 4V X5R 0402-1 ROOM=SOC_FILT

AC37	VDD_SOC_S1P5	
AG24	VDD_SOC_S1P5	
AG33	VDD_SOC_S1P5	
AG50	VDD_SOC_S1P5	
AJ22	VDD_SOC_S1P5	
AJ27	VDD_SOC_S1P5	
AJ31	VDD_SOC_S1P5	
AJ35	VDD_SOC_S1P5	
AJ40	VDD_SOC_S1P5	
AJ44	VDD_SOC_S1P5	
AJ48	VDD_SOC_S1P5	
AL29	VDD_SOC_S1P5	
AL33	VDD_SOC_S1P5	
AL37	VDD_SOC_S1P5	
AN14	VDD_SOC_S1P5	
AN31	VDD_SOC_S1P5	
AN35	VDD_SOC_S1P5	
AN40	VDD_SOC_S1P5	
AR11	VDD_SOC_S1P5	
AR16	VDD_SOC_S1P5	
AR20	VDD_SOC_S1P5	
AU18	VDD_SOC_S1P5	
AU40	VDD_SOC_S1P5	
AU44	VDD_SOC_S1P5	
AW11	VDD_SOC_S1P5	
AW16	VDD_SOC_S1P5	
AW20	VDD_SOC_S1P5	
BA14	VDD_SOC_S1P5	
BC11	VDD_SOC_S1P5	
BC16	VDD_SOC_S1P5	
BC20	VDD_SOC_S1P5	
BE18	VDD_SOC_S1P5	
BG11	VDD_SOC_S1P5	
BG16	VDD_SOC_S1P5	
BG20	VDD_SOC_S1P5	
BJ14	VDD_SOC_S1P5	
BL16	VDD_SOC_S1P5	
BL24	VDD_SOC_S1P5	
BL50	VDD_SOC_S1P5	
BN18	VDD_SOC_S1P5	
BN27	VDD_SOC_S1P5	
BN53	VDD_SOC_S1P5	
BR20	VDD_SOC_S1P5	
BR24	VDD_SOC_S1P5	
BR29	VDD_SOC_S1P5	
BU22	VDD_SOC_S1P5	
BU50	VDD_SOC_S1P5	
BW20	VDD_SOC_S1P5	
BW24	VDD_SOC_S1P5	
BW29	VDD_SOC_S1P5	
BW53	VDD_SOC_S1P5	

CA27	VDD_SOC_S1P5	PP_SOC_S1P5 (18 39)
CA50	VDD_SOC_S1P5	
CC20	VDD_SOC_S1P5	
CC24	VDD_SOC_S1P5	
CC29	VDD_SOC_S1P5	
CE22	VDD_SOC_S1P5	
CG16	VDD_SOC_S1P5	
CG20	VDD_SOC_S1P5	
CG24	VDD_SOC_S1P5	
CG29	VDD_SOC_S1P5	
CG42	VDD_SOC_S1P5	
CG50	VDD_SOC_S1P5	
CJ27	VDD_SOC_S1P5	
CJ40	VDD_SOC_S1P5	
CJ48	VDD_SOC_S1P5	
L35	VDD_SOC_S1P5	
L50	VDD_SOC_S1P5	
N9	VDD_SOC_S1P5	
BL20	VDD_SOC_SENSE	ANALOG_SOC_SENSE_P (128)
BL18	VSS_SOC_SENSE	ANALOG_SOC_SENSE_N (128)

Apple Proprietary and Confidential

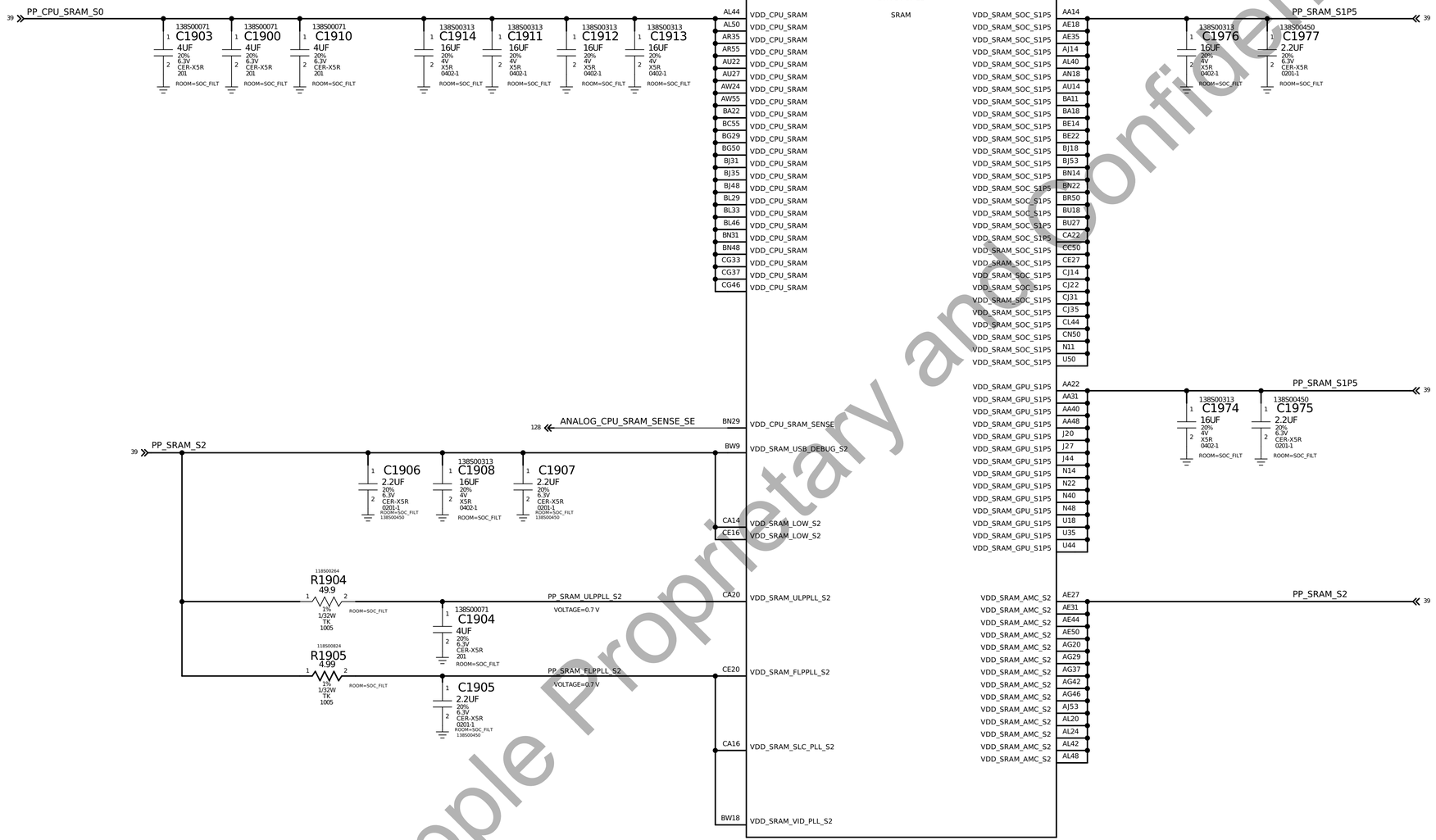
PAGE TITLE
SOC: Power (CPU/GPU & SOC) (18)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: SRAM



Apple Proprietary and Confidential

PAGE TITLE

SOC: Power (SRAM) (19)

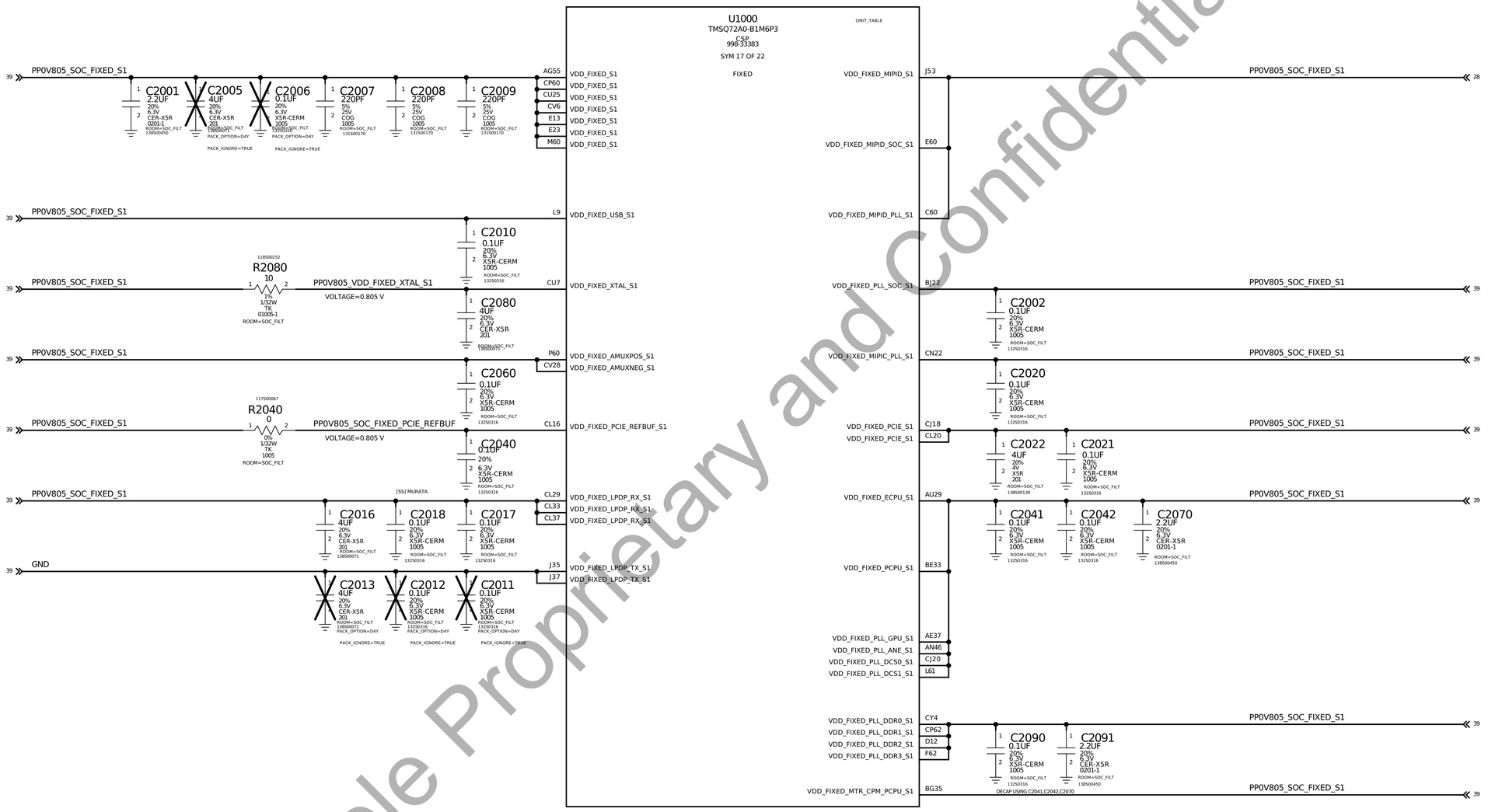
Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: FIXED



Apple Proprietary and Confidential

PAGE TITLE
SOC: Power (Fixed) (20)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SUBSYSTEM SPECIFIC BOM TABLES

4uF 0201 Capacitors (single-source Murata)

RefDes in () are singled-sourced from Murata

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00116	138S00071	(C2128,C2137,C2180-C2183,C2185-C2188,C2190-C2193)	CAP,X5R,4UF,0201,0.55MM,TAIYO
138S00117	138S00071	(C2128,C2137,C2180-C2183,C2185-C2188,C2190-C2193)	CAP,X5R,4UF,0201,0.55MM,KYOCERA
138S00515	138S00071	(C2128,C2137,C2180-C2183,C2185-C2188,C2190-C2193)	CAP,X5R,4UF,0201,0.55MM,SEMCO

SOC: AOP/AVE/ISP/USB

U1000 TMSQ72A0-B1M6P3 CSP 998-33383 SYM 15 OF 22 — OMIT_TABLE — LOW/AVE/DISP

PLACE AT SOC BALLS

39 PP_VDD_LOW_S2 → BL11, BR11, BR16, BU14, BW11, BW16, CC16, CE14 (VDD_LOW_S2)

- C2120 0.1UF 20% 6.3V X5R-CERM 1005 — ROOM=SOC_FILT — 13250316
- C2100 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT — 138S00450
- C2101 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT — 138S00450

VDD_DISP_S1 → AA18, AC16, AE14, AG16, AJ18, AL11, AL16, W16

PP_DISP_S1 39

- 138S00313 C2134 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT
- 138S00313 C2133 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT
- 138S00313 C2139 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT — PACK_OPTION=DAY — PACK_IGNORE=TRUE
- 138S00313 C2138 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT
- 138S00071 C2137 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT
- 138S00450 C2135 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT
- 138S00450 C2136 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT

39 PP_AVE_S0 → CJ44, CL42, CL46, CL50, CN40, CN44, CN48 (VDD_AVE)

- 138S00071 C2128 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT
- 138S00313 C2127 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT
- 138S00313 C2126 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT
- 138S00313 C2125 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT
- 138S00149 C2129 14UF 20% 4V X5R 0402-DZX-1 — ROOM=SOC_FLT

VDD_DISP_SENSE → AL18 → ANALOG_DISP_SENSE_SE 128

SOC: DDR

U1000 TMSQ72A0-B1M6P3 CSP 998-33383 SYM 16 OF 22 — OMIT_TABLE — DDR

39 PP0V5_VDDQL_S1

- C2193 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2192 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2191 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2190 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071

PLACE CAPS ON SOC CORNERS

BM1, BV1, CA9, CL1, CN9, CT1, CV1 → VDDQL_DDR0_S1

BB63, BG63, BP63, CA55, CH63, CL63, CN55, CU63 → VDDQL_DDR1_S1

AF1, AG9, AP1, AY1, D1, L1, P1, W9 → VDDQL_DDR2_S1

AC55, AF63, AK63, AP63, D63, G63, L55, M63 → VDDQL_DDR3_S1

128 ANALOG_VDDQL_SENSE_SE ← K60 VDDQL_SENSE

39 PP_DCS_S1

- C2188 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2187 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2186 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2185 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071

PLACE CAPS ON SOC CORNERS

CC9, CL9 → VDD_DCS_DDR0_S1

CC55, CL55 → VDD_DCS_DDR1_S1

AJ9, U9 → VDD_DCS_DDR2_S1

AA55, H62, N55 → VDD_DCS_DDR3_S1

128 ANALOG_DCS_SENSE_SE ← H62 IS VDD_DCS_SENSE

128 ANALOG_DDR_SENSE_SE ← H61 VSS_DDR_SENSE

BF1, BF2, BK1, BY1, CD1, CH1, CP1, CR2, CU1, CW3 → VDD2H_DDR0_S2

PP1V1_VDD2H_DDR_S2 39

- C2180 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2181 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2182 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2183 4UF 20% 6.3V CER-X5R 201 — ROOM=SOC_FILT — 138S00071
- C2184 16UF 20% 4V X5R 0402-1 — ROOM=SOC_FILT — 138S00313

PLACE CAPS ON SOC CORNERS

BD63, BF62, BK63, BV63, BY63, CD63, CR63, CU62, CV61 → VDD2H_DDR1_S2

AB1, AD1, AK1, AV1, AY3, D3, H1, V1 → VDD2H_DDR2_S2

AC63, AM63, AT62, AV63, D61, D62, K63, T63, Y63 → VDD2H_DDR3_S2

PP1V825_S2 39

- C2196 0.22UF 10% 6.3V CER-X5R 1005 — ROOM=SOC_FILT — 132S00014
- C2197 0.22UF 10% 6.3V CER-X5R 1005 — ROOM=SOC_FILT — 132S00014
- C2198 0.22UF 10% 6.3V CER-X5R 1005 — ROOM=SOC_FILT — 132S00014
- C2199 0.22UF 10% 6.3V CER-X5R 1005 — ROOM=SOC_FILT — 132S00014

PLACE CAPS ON SOC CORNERS

BG2, CW2 → VDD1_DDR0_S2

BH63, CW62 → VDD1_DDR1_S2

AT1, C2 → VDD1_DDR2_S2

AT63, C62 → VDD1_DDR3_S2

PP1V1_AMPH_S2 39

- C2170 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT — 138S00450
- C2171 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT — 138S00450
- C2172 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT — 138S00450
- C2173 2.2UF 20% 6.3V CER-X5R 0201-1 — ROOM=SOC_FILT — 138S00450

PLACE CAPS ON SOC CORNERS

CC11, CL11 → VDD_AMPH_DDR0_S2

CC53, CL53 → VDD_AMPH_DDR1_S2

AG11, W11 → VDD_AMPH_DDR2_S2

AA53, N53 → VDD_AMPH_DDR3_S2

VDD_AMPH_SENSE K61 → ANALOG_AMPH_SENSE_SE 128

Apple Proprietary and Confidential

PAGE TITLE: SOC: Power (DDR & AOP/AVE/ISP/USB) (21)

Apple Inc.

DRAWING NUMBER: D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

SOC: VDD12

U1000
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 18 OF 22
VDD12

OMIT_TABLE

[LAYOUT] VDDIO12_GRPx: Isolation >= 2.5nH
from other nets on the same domain

Place cap near pin

Place 01005 caps
near pins

Apple Proprietary and Confidential

PAGE TITLE	
SOC: Power (1V2) (22)	
Apple Inc.	DRAWING NUMBER / SIZE

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SOC: GND

U1000 OMIT_TABLE
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 19 OF 22

A2	VSS	VSS	AN42
A3	VSS	VSS	AN50
A8	VSS	VSS	AN55
A12	VSS	VSS	AP4
A13	VSS	VSS	AP60
A26	VSS	VSS	AR1
A28	VSS	VSS	AR9
A39	VSS	VSS	AR14
A41	VSS	VSS	AR18
A45	VSS	VSS	AR22
A51	VSS	VSS	AR27
AA16	VSS	VSS	AR31
AA20	VSS	VSS	AR40
AA24	VSS	VSS	AR44
AA29	VSS	VSS	AR63
AA33	VSS	VSS	AT60
AA37	VSS	VSS	AU11
AA42	VSS	VSS	AU16
AA46	VSS	VSS	AU20
AA50	VSS	VSS	AU24
AB63	VSS	VSS	AU33
AC1	VSS	VSS	AU37
AC4	VSS	VSS	AU42
AC14	VSS	VSS	AU46
AC18	VSS	VSS	AV4
AC22	VSS	VSS	AW9
AC27	VSS	VSS	AW14
AC31	VSS	VSS	AW18
AC35	VSS	VSS	AW22
AC40	VSS	VSS	AW27
AC44	VSS	VSS	AY2
AC48	VSS	VSS	AY63
AC53	VSS	VSS	A52
AC60	VSS	VSS	A60
AD63	VSS	VSS	A61
AE16	VSS	VSS	A62
AE20	VSS	VSS	B1
AE24	VSS	VSS	B4
AE29	VSS	VSS	B7
AE33	VSS	VSS	B13
AE42	VSS	VSS	B26
AE46	VSS	VSS	B28
AG14	VSS	VSS	E4
AG18	VSS	VSS	E7
AG22	VSS	VSS	E8
AG27	VSS	VSS	E15
AG31	VSS	VSS	E17
AG35	VSS	VSS	E19
AG40	VSS	VSS	E21
AG44	VSS	VSS	E25
AG48	VSS	VSS	E26
AG53	VSS	VSS	E28
AH1	VSS	VSS	E30
AH4	VSS	VSS	E32
AH60	VSS	VSS	E43
AH63	VSS	VSS	E49
AJ11	VSS	VSS	E54
AJ16	VSS	VSS	E58
AJ20	VSS	VSS	E61
AJ24	VSS	VSS	E62
AJ29	VSS	VSS	E63
AJ33	VSS	VSS	F60
AJ37	VSS	VSS	F61
AJ42	VSS	VSS	F63
AJ46	VSS	VSS	G1
AJ50	VSS	VSS	G62
AK62	VSS	VSS	H4
AL9	VSS	VSS	H63
AL14	VSS	VSS	J9
AL22	VSS	VSS	J29
AL27	VSS	VSS	J42
AL31	VSS	VSS	J46
AL35	VSS	VSS	J55
AL53	VSS	VSS	K1
AM1	VSS	VSS	L14
AN11	VSS	VSS	L18
AN16	VSS	VSS	L22
AN20	VSS	VSS	L27
AN24	VSS	VSS	L31
AN37	VSS	VSS	L44

U1000 OMIT_TABLE
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 20 OF 22

L48	VSS	VSS	B30
L53	VSS	VSS	B32
L60	VSS	VSS	B36
L63	VSS	VSS	B41
M1	VSS	VSS	B43
M4	VSS	VSS	BA16
M61	VSS	VSS	BA20
M62	VSS	VSS	BA24
N16	VSS	VSS	BA42
N20	VSS	VSS	BA46
N33	VSS	VSS	BA55
N37	VSS	VSS	BB60
N42	VSS	VSS	BB62
N46	VSS	VSS	BC14
N50	VSS	VSS	BC18
P63	VSS	VSS	BC27
R9	VSS	VSS	BC44
R14	VSS	VSS	BC48
R18	VSS	VSS	BC53
R22	VSS	VSS	BD2
R35	VSS	VSS	BE11
R40	VSS	VSS	BE16
R44	VSS	VSS	BE20
R48	VSS	VSS	BE24
T1	VSS	VSS	BE29
U11	VSS	VSS	BE37
U16	VSS	VSS	BE42
U33	VSS	VSS	BE46
U37	VSS	VSS	BE50
U42	VSS	VSS	BE55
U46	VSS	VSS	BF3
V4	VSS	VSS	BF4
V60	VSS	VSS	BF63
V61	VSS	VSS	BG9
V63	VSS	VSS	BG14
W14	VSS	VSS	BG18
W18	VSS	VSS	BG22
W22	VSS	VSS	BG27
W27	VSS	VSS	BG31
W31	VSS	VSS	BG40
W35	VSS	VSS	BG44
W40	VSS	VSS	BG48
W44	VSS	VSS	BG53
W48	VSS	VSS	BG60
Y1	VSS	VSS	BH2
		VSS	BH4
		VSS	BH62
		VSS	BJ11
		VSS	BJ16
		VSS	BJ20
		VSS	BJ24
		VSS	BJ29
		VSS	BJ33
		VSS	BJ42
		VSS	BJ46
		VSS	BJ50
		VSS	BL9
		VSS	BL14
		VSS	BL22
		VSS	BL27
		VSS	BL31
		VSS	BL35
		VSS	BL40
		VSS	BL44
		VSS	BL48
		VSS	BL53
		VSS	BL55
		VSS	BM60
		VSS	BM63
		VSS	BN11
		VSS	BN16
		VSS	BN20
		VSS	BN24
		VSS	BN33
		VSS	BN50
		VSS	BP1
		VSS	BP4
		VSS	BR9
		VSS	BR14
		VSS	BR18

U1000 OMIT_TABLE
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 21 OF 22

BR22	VSS	VSS	CK1
BR27	VSS	VSS	CK4
BR31	VSS	VSS	CK63
BR48	VSS	VSS	CL3
BT63	VSS	VSS	CL18
BU11	VSS	VSS	CL22
BU16	VSS	VSS	CL27
BU20	VSS	VSS	CL31
BU24	VSS	VSS	CL35
BU29	VSS	VSS	CL40
BU33	VSS	VSS	CL48
BU53	VSS	VSS	CL60
BU55	VSS	VSS	CL62
BV60	VSS	VSS	CM1
BW1	VSS	VSS	CM60
BW4	VSS	VSS	CM61
BW14	VSS	VSS	CM62
BW22	VSS	VSS	CM63
BW27	VSS	VSS	CN11
BW31	VSS	VSS	CN16
BW48	VSS	VSS	CN29
BW50	VSS	VSS	CN33
BW63	VSS	VSS	CN37
CA11	VSS	VSS	CN42
B47	VSS	VSS	CN46
B52	VSS	VSS	CN53
B60	VSS	VSS	CP63
B63	VSS	VSS	CR1
C1	VSS	VSS	CR3
C10	VSS	VSS	CR4
C12	VSS	VSS	CR61
C13	VSS	VSS	CR62
C15	VSS	VSS	CT63
C17	VSS	VSS	CU6
C19	VSS	VSS	CU8
C21	VSS	VSS	CU13
C23	VSS	VSS	CU15
C25	VSS	VSS	CU17
C26	VSS	VSS	CU19
C41	VSS	VSS	CU21
C43	VSS	VSS	CU23
C45	VSS	VSS	CU26
C47	VSS	VSS	CU30
CA24	VSS	VSS	CU32
CA29	VSS	VSS	CU34
CA33	VSS	VSS	CU51
CA53	VSS	VSS	CU54
CB1	VSS	VSS	CU56
CB60	VSS	VSS	CU58
CB63	VSS	VSS	CU59
CC14	VSS	VSS	CV2
CC18	VSS	VSS	CV5
CC22	VSS	VSS	CV7
CC27	VSS	VSS	CV10
CC48	VSS	VSS	CV15
CD4	VSS	VSS	CV21
CE24	VSS	VSS	CV26
CE33	VSS	VSS	CV36
CE37	VSS	VSS	CV39
CE42	VSS	VSS	CV41
CE46	VSS	VSS	CV45
CE50	VSS	VSS	CV49
CF1	VSS	VSS	CV52
CF63	VSS	VSS	CV56
CG14	VSS	VSS	CV58
CG27	VSS	VSS	CV59
CG31	VSS	VSS	CV60
CG35	VSS	VSS	CV63
CG40	VSS	VSS	CW1
CG44	VSS	VSS	CW5
CG48	VSS	VSS	CW7
CH60	VSS	VSS	CW8
CJ16	VSS	VSS	CW12
CJ24	VSS	VSS	CW13
CJ29	VSS	VSS	CW17
CJ33	VSS	VSS	CW19
CJ37	VSS	VSS	CW23
CJ42	VSS	VSS	CW25
CJ46	VSS	VSS	CW26
CJ50	VSS	VSS	CW36

VSS CL60:
MLB:
- Connect to GND
DEV:
- Used for DUT detect

GND 27

U1000 OMIT_TABLE
TMSQ72A0-B1M6P3
CSP
998-33383
SYM 22 OF 22

CW38	VSS	VSS	D23
CW39	VSS	VSS	D25
CW43	VSS	VSS	D26
CW47	VSS	VSS	D28
CW51	VSS	VSS	D30
CW54	VSS	VSS	DA3
CW56	VSS	VSS	DA4
CW57	VSS	VSS	DA5
CW58	VSS	VSS	DA6
CW59	VSS	VSS	DA7
CW60	VSS	VSS	DA8
CW61	VSS	VSS	DA10
CW63	VSS	VSS	DA15
CY1	VSS	VSS	DA21
CY6	VSS	VSS	DA26
CY7	VSS	VSS	DA32
CY8	VSS	VSS	DA34
CY12	VSS	VSS	DA39
CY13	VSS	VSS	DA41
CY17	VSS	VSS	DA45
CY19	VSS	VSS	DA49
CY23	VSS	VSS	DA52
CY25	VSS	VSS	DA56
CY26	VSS	VSS	DA57
CY28	VSS	VSS	DA58
CY30	VSS	VSS	DA59
CY34	VSS	VSS	DA60
CY39	VSS	VSS	DA61
CY56	VSS	VSS	DA62
CY57	VSS	VSS	D32
CY58	VSS	VSS	D38
CY59	VSS	VSS	D57
CY60	VSS	VSS	E1
CY61	VSS		
CY63	VSS		
DA2	VSS		
C49	VSS		
C51	VSS		
C52	VSS		
C54	VSS		
C56	VSS		
C57	VSS		
C58	VSS		
C59	VSS		
C61	VSS		
C63	VSS		
D2	VSS		
D8	VSS		
D10	VSS		
D13	VSS		
D15	VSS		
D17	VSS		
D19	VSS		
D21	VSS		

VSS_1	DA1	GND	27
VSS_2	DA63	GND	27
VSS_3	A1	GND	27
VSS_4	A63	GND	27

DIE_CORNER_DC_NE	B61	GPIO_AP_SOC_DC_CANARY1	144
DIE_CORNER_DC_NW	C8	GPIO_AP_SOC_DC_CANARY3	144
DIE_CORNER_DC_SW	CY5	GPIO_AP_SOC_DC_CANARY4	144
DIE_CORNER_DC_SE	CV62	GPIO_AP_SOC_DC_CANARY2	144

Apple Proprietary & Confidential

PAGE TITLE
SOC: Power (GND) (23)

Apple Inc.

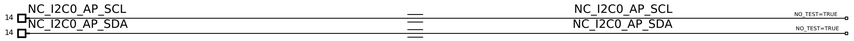
DRAWING NUMBER
D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

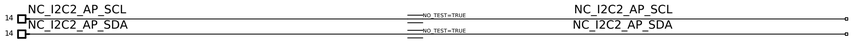
AP/ISP I2C

AP I2C0 (Unused)

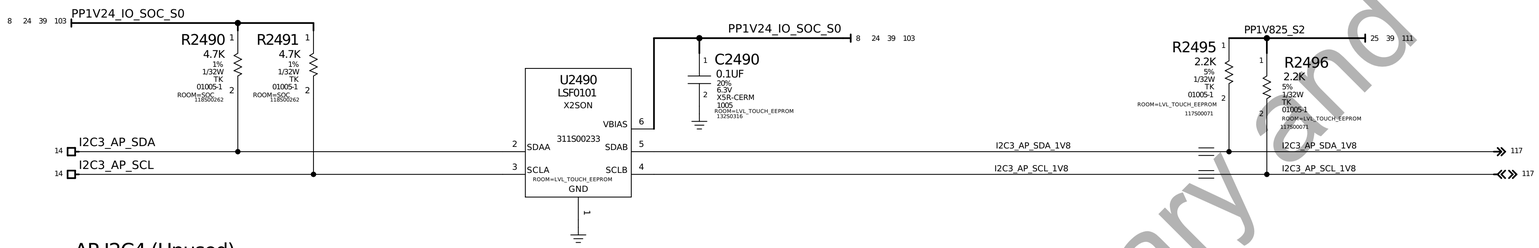


AP I2C1 (Unused)

AP I2C2 (Unused)



AP I2C3



DOMAIN	AP	NUMBER	I2C3	DIAGS NUMBER	3	SPEED	400kHz
DEVICE	VOLTAGE	7-BIT ADDR	8-BIT ADDR	MAX SPEED	LOCATION		
Touch EEPROM	1.8V	0x51	0xA2, 0xA3	400kHz	Display Flex		

AP I2C4 (Unused)

SI2C0

ISP I2C0 (Unused)

ISP I2C1 (Unused)

Apple Proprietary and Confidential

PAGE TITLE
SOC: Aliases: I2C AP/ISP (24)

Apple Inc.

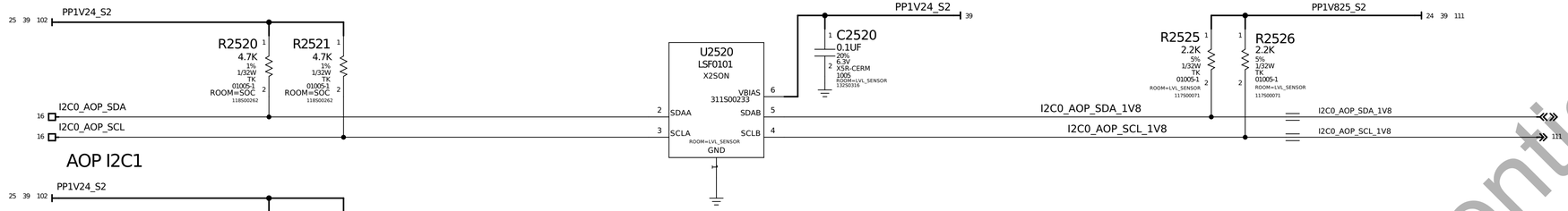
DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

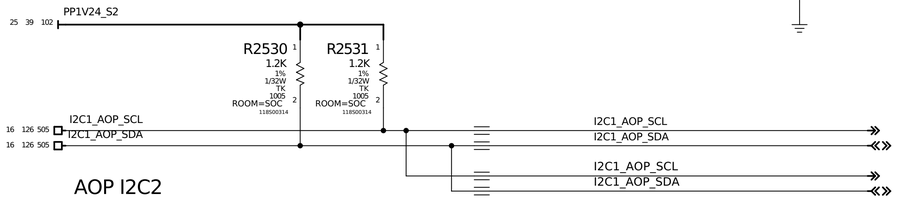
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

AOP/SMC/MTP I2C

AOP I2C0

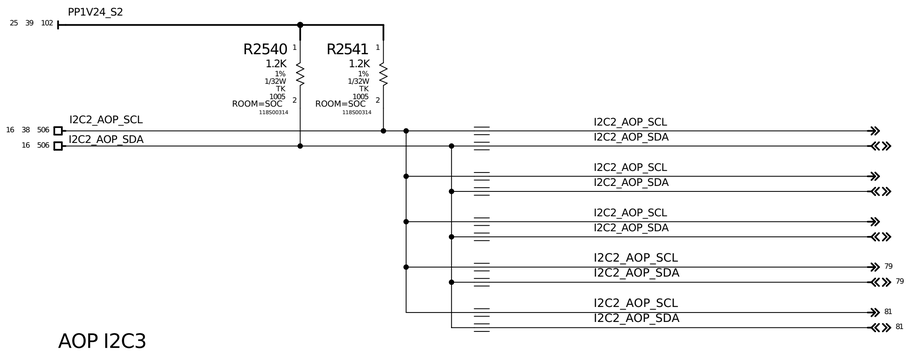


AOP I2C1



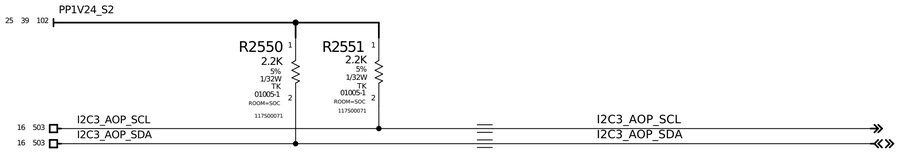
DOMAIN	AOP	NUMBER	I2C1	DIAGS NUMBER	6	SPEED	400kHz
DEVICE	VOLTAGE	7-BIT ADDR	8-BIT ADDR	MAX SPEED	LOCATION		
BARO	1.2V	0x76	0xEC, 0xED	1MHz	Dock		
Arc EEPROM	1.2V	0x50	0xA0, 0xA1	400kHz	Arc Flex		

AOP I2C2



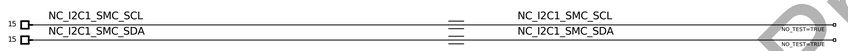
DOMAIN	AOP	NUMBER	I2C2	DIAGS NUMBER	7	SPEED	1MHz
DEVICE	VOLTAGE	7-BIT ADDR	8-BIT ADDR	MAX SPEED	LOCATION		
Sakonnet	1.2V	0x08	0x10, 0x11	1MHz	MLB		
Codec	1.2V	0x4A	0x94, 0x95	1MHz	MLB		
Arc Amp	1.2V	0x42	0x84, 0x85	1MHz	MLB		
TOP Spk Amp	1.2V	0x41	0x82, 0x83	1MHz	MLB		
BOT Spk Amp	1.2V	0x40	0x80, 0x81	1MHz	MLB		

AOP I2C3

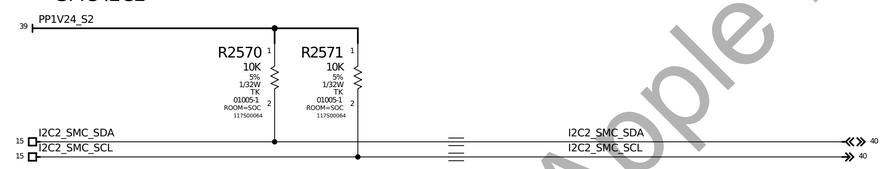


DOMAIN	AOP	NUMBER	I2C3	DIAGS NUMBER	12	SPEED	400KHz
DEVICE	VOLTAGE	7-BIT ADDR	8-BIT ADDR	MAX SPEED	LOCATION		
Grimaldi	1.2V	0x3A	0x74,0x75	1MHz	BG Flex		
BG ID EEPROM	1.2V	0x50	0xA0, 0xA1	400KHz	BG Flex		

SMC I2C1 (Unused)



SMC I2C2



DOMAIN	SMC	NUMBER	I2C2	DIAGS NUMBER	10	SPEED	400kHz
DEVICE	VOLTAGE	7-BIT ADDR	8-BIT ADDR	MAX SPEED	LOCATION		
Rubicon	1.2V	0x71	0xE2, 0xE3	1MHz	MLB		
Veridian	1.8V	0x0B	0x16, 0x17	400kHz	Battery Flex		

MTP I2C0 (Unused)

Apple Proprietary and Confidential

PAGE TITLE
SOC: Aliases: I2C AOP/SMC/MTP (25)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

AOP GPIOs

AOP_UART2_RXD	16	NC_AOP_UART2_RXD	NC_AOP_UART2_RXD	NO_TEST=TRUE	
AOP_UART2_TXD	16	NC_AOP_UART2_TXD	NC_AOP_UART2_TXD	NO_TEST=TRUE	
AOP_FUNC0	16	GPIO_SCM_AOP_FROM_IMU_DATARDY	GPIO_SCM_AOP_FROM_IMU_DATARDY		73 129
AOP_FUNC1	16	GPIO_SCM_AOP_TO_IMU_SPI_CS_L	GPIO_SCM_AOP_TO_IMU_SPI_CS_L		73
AOP_FUNC2	16	GPIO_SCM_AOP_FROM_COMPASS_INT	GPIO_SCM_AOP_FROM_COMPASS_INT		102
AOP_FUNC3	16	GPIO_SCM_AOP_BI_PROX_INT_L	GPIO_SCM_AOP_BI_PROX_INT_L		102
AOP_FUNC4	16	GPIO_SCM_AOP_FROM_ALS_INT_L	GPIO_SCM_AOP_FROM_ALS_INT_L		111
AOP_FUNC5	16	GPIO_AOP_TO_CODEC_RESET_L	GPIO_AOP_TO_CODEC_RESET_L		79 128
AOP_FUNC6	16	NC_AOP_FUNC6	NC_AOP_FUNC6	NO_TEST=TRUE	
AOP_FUNC7	16	NC_AOP_FUNC7	NC_AOP_FUNC7	NO_TEST=TRUE	
AOP_FUNC8	16	NC_AOP_FUNC8	NC_AOP_FUNC8	NO_TEST=TRUE	
AOP_FUNC9	16	GPIO_SCM_AOP_TO_GNSS_SPI_CS_L	GPIO_SCM_AOP_TO_GNSS_SPI_CS_L		504
AOP_FUNC10	16	NC_AOP_FUNC10	NC_AOP_FUNC10	NO_TEST=TRUE	
AOP_FUNC11	16	NC_AOP_FUNC11	NC_AOP_FUNC11	NO_TEST=TRUE	
AOP_FUNC12	16	GPIO_AOP_FROM_GNSS_HOST_REQ	GPIO_AOP_FROM_GNSS_HOST_REQ		504
AOP_FUNC13	16	NC_AOP_FUNC13	NC_AOP_FUNC13	NO_TEST=TRUE	
AOP_FUNC14	16	GPIO_AOP_TO_BBMUX_SEL	GPIO_AOP_TO_BBMUX_SEL		103
AOP_FUNC15	16	GPIO_AOP_FROM_BARO_INT_L	GPIO_AOP_FROM_BARO_INT_L		505
AOP_I2S2_MCLK	16	GPIO_AOP_TO_SPKRAMP_TOP_RESET_L	GPIO_AOP_TO_SPKRAMP_TOP_RESET_L		81

NUB GPIOs

NUB_SCM_IO0	15	GPIO_NUB_FROM_BB_WDOG_L	GPIO_NUB_FROM_BB_WDOG_L		503
NUB_SCM_IO1	15	GPIO_NUB_TO_BB_FORCE_PWM	GPIO_NUB_TO_BB_FORCE_PWM		504
NUB_SCM_IO2	15	NC_NUB_GPIO2	NC_NUB_GPIO2	NO_TEST=TRUE	
NUB_SCM_IO3	15	NC_NUB_GPIO3	NC_NUB_GPIO3	NO_TEST=TRUE	
NUB_SCM_IO4	15	GPIO_NUB_TO_BB_DEBUG_EN	GPIO_NUB_TO_BB_DEBUG_EN		503
NUB_SCM_IO5	15	GPIO_BB_TO_NUB_GSM_TXBURST_IND	GPIO_BB_TO_NUB_GSM_TXBURST_IND		506
NUB_SCM_IO6	15	NC_NUB_GPIO6	NC_NUB_GPIO6	NO_TEST=TRUE	
NUB_SCM_IO7	15	NC_NUB_GPIO7	NC_NUB_GPIO7	NO_TEST=TRUE	
NUB_SCM_IO8	15	GPIO_NUB_FROM_BANFF_B2B_DETECT_L	GPIO_NUB_FROM_BANFF_B2B_DETECT_L		27 507
NUB_SCM_IO9	15	NC_NUB_GPIO9	NC_NUB_GPIO9	NO_TEST=TRUE	
NUB_SCM_IO10	15	NC_NUB_GPIO10	NC_NUB_GPIO10	NO_TEST=TRUE	
NUB_SCM_IO11	15	GPIO_NUB_FROM_DISPLAY_PANEL_ID	GPIO_NUB_FROM_DISPLAY_PANEL_ID		118
NUB_SCM_IO12	15	IO_BUTTON_RINGER_L	IO_BUTTON_RINGER_L		38 503
NUB_SCM_IO13	15	GPIO_NUB_TO_TOUCH_RESET_L	GPIO_NUB_TO_TOUCH_RESET_L		27 117
NUB_SCM_IO14	15	NC_NUB_GPIO14	NC_NUB_GPIO14	NO_TEST=TRUE	
NUB_SCM_IO15	15	NC_NUB_GPIO15	NC_NUB_GPIO15	NO_TEST=TRUE	

MTP GPIOs

MTP_FUNC0	15	GPIO_MTP_FROM_TOUCH_INT0_L	GPIO_MTP_FROM_TOUCH_INT0_L		117
MTP_FUNC1	15	IO_TOUCH_TO_MANY_SCAN_ACTIVE	IO_TOUCH_TO_MANY_SCAN_ACTIVE		39
MTP_FUNC2	15	NC_MTP_GPIO2	NC_MTP_GPIO2	NO_TEST=TRUE	
MTP_FUNC3	15	NC_MTP_GPIO3	NC_MTP_GPIO3	NO_TEST=TRUE	

AP GPIOs

AP_GPIO0	15	GPIO_BOARD_REV3	GPIO_BOARD_REV3		8
AP_GPIO1	15	GPIO_BOARD_REV2	GPIO_BOARD_REV2		8
AP_GPIO2	15	GPIO_BOARD_REV1	GPIO_BOARD_REV1		8
AP_GPIO3	15	GPIO_BOARD_REV0	GPIO_BOARD_REV0		8
AP_GPIO4	15	GPIO_AP_INTERPOSER_CANARY10_AP_TO_A	GPIO_AP_INTERPOSER_CANARY10_AP_TO_A		505
AP_GPIO5	15	GPIO_AP_INTERPOSER_CANARY9_AP_TO_A	GPIO_AP_INTERPOSER_CANARY9_AP_TO_A		504
AP_GPIO6	15	GPIO_AP_BI_ACE_SWDIO	GPIO_AP_BI_ACE_SWDIO		95 128
AP_GPIO7	15	GPIO_AP_TO_ACE_SWCLK	GPIO_AP_TO_ACE_SWCLK		95 128
AP_GPIO8	15	GPIO_AP_INTERPOSER_CANARY11_AP_TO_A	GPIO_AP_INTERPOSER_CANARY11_AP_TO_A		506
AP_GPIO9	15	GPIO_AP_FROM_BT_AUDIO_SYNC	GPIO_AP_FROM_BT_AUDIO_SYNC		503
AP_GPIO10	15	GPIO_AP_FROM_ACE_DFU_BOOTED_L	GPIO_AP_FROM_ACE_DFU_BOOTED_L		96
AP_GPIO11	15	NC_AP_GPIO11	NC_AP_GPIO11	NO_TEST=TRUE	
AP_GPIO12	15	GPIO_AP_SOC_DC_CANARY2	GPIO_AP_SOC_DC_CANARY2		129 144
AP_GPIO13	15	GPIO_AP_INTERPOSER_CANARY6_AP_TO_A	GPIO_AP_INTERPOSER_CANARY6_AP_TO_A		503
AP_GPIO14	15	GPIO_AP_INTERPOSER_CANARY7_AP_TO_A	GPIO_AP_INTERPOSER_CANARY7_AP_TO_A		503
AP_GPIO15	15	NC_AP_GPIO15	NC_AP_GPIO15	NO_TEST=TRUE	
AP_GPIO16	15	GPIO_AP_FROM_CODEC_INT_L	GPIO_AP_FROM_CODEC_INT_L		79 128
AP_GPIO17	15	GPIO_AP_TO_AMUX_PMU_SYNC	GPIO_AP_TO_AMUX_PMU_SYNC		38
AP_GPIO18	15	GPIO_AP_SOC_DC_CANARY1	GPIO_AP_SOC_DC_CANARY1		129 144
AP_GPIO19	15	NC_AP_GPIO19	NC_AP_GPIO19	NO_TEST=TRUE	
AP_GPIO20	15	GPIO_AP_SOC_DC_CANARY4	GPIO_AP_SOC_DC_CANARY4		129 144
AP_GPIO21	15	GPIO_AP_FROM_WLAN_TIME_SYNC	GPIO_AP_FROM_WLAN_TIME_SYNC		503
AP_GPIO22	15	GPIO_AP_INTERPOSER_CANARY8_AP_TO_A	GPIO_AP_INTERPOSER_CANARY8_AP_TO_A		504
AP_GPIO23	15	GPIO_AP_SOC_DC_CANARY3	GPIO_AP_SOC_DC_CANARY3		129 144
AP_GPIO24	15	GPIO_AP_INTERPOSER_CANARY5_AP_TO_A	GPIO_AP_INTERPOSER_CANARY5_AP_TO_A		507
AP_GPIO25	15	NC_AP_GPIO25	NC_AP_GPIO25	NO_TEST=TRUE	

SEP_GPIO0	14 39	IO_PMU_TO_SEP_DOUBLE_CLICK_DET	IO_PMU_TO_SEP_DOUBLE_CLICK_DET		36 39 128
SEP_GPIO1	14	NC_SOC_S_GPIO1	NC_SOC_S_GPIO1	NO_TEST=TRUE	
SEP_GPIO2	14	NC_SOC_S_GPIO2	NC_SOC_S_GPIO2	NO_TEST=TRUE	

Apple Proprietary and Confidential

PAGE TITLE

SOC: Aliases: GPIOs (26)

Apple Inc.

DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Misc. SoC Aliases

15	NC_DEV_AP_MIC_DISABLE_L	NC_DEV_AP_MIC_DISABLE_L	NO_TEST=TRUE
15	NC_DEV_AP_MIC_DISABLE_WARN_L	NC_DEV_AP_MIC_DISABLE_WARN_L	NO_TEST=TRUE
10	NC_AP_TMR32_PWM0	NC_AP_TMR32_PWM0	NO_TEST=TRUE
10	NC_AP_TMR32_PWM1	NC_AP_TMR32_PWM1	NO_TEST=TRUE
10	NC_AP_TMR32_PWM2	NC_AP_TMR32_PWM2	NO_TEST=TRUE
10	NC_DEV_AP_MTR_TD_B	NC_DEV_AP_MTR_TD_B	NO_TEST=TRUE
10	NC_DEV_AP_MTR_TD_BS	NC_DEV_AP_MTR_TD_BS	NO_TEST=TRUE
10	NC_DEV_AP_MTR_TD_E	NC_DEV_AP_MTR_TD_E	NO_TEST=TRUE
10	NC_DEV_AP_MTR_TD_ES	NC_DEV_AP_MTR_TD_ES	NO_TEST=TRUE
22	NC_DEV_SOC_VDDA_TD	NC_DEV_SOC_VDDA_TD	NO_TEST=TRUE
36 128	IO_PMU_TO_SYSTEM_RESET_L	IO_PMU_TO_SYSTEM_RESET_L	15
		IO_PMU_TO_SYSTEM_RESET_L	15
		IO_PMU_TO_SYSTEM_RESET_L	15
	NC_SOC_THROTTLE_TRIGGER0 NO_TEST=TRUE	NC_SOC_THROTTLE_TRIGGER0	10
128	IO_AP_FROM_PMU_UVWARN1_L	IO_AP_FROM_PMU_UVWARN1_L	10
		IO_AP_FROM_PMU_UVWARN1_L	36
128	IO_AP_FROM_PMU_UVWARN0_L	IO_AP_FROM_PMU_UVWARN0_L	10
		IO_AP_FROM_PMU_UVWARN0_L	36
128	IO_AP_FROM_PMU_PRE_SHDN_L	IO_AP_FROM_PMU_PRE_SHDN_L	36
		IO_AP_FROM_PMU_PRE_SHDN_L	10
	NC_SOC_THROTTLE_TRIGGER4	NC_SOC_THROTTLE_TRIGGER4	10
10 128	IO_SOC_TO_PMU_SOCHOT_RESET_L	IO_SOC_TO_PMU_SOCHOT_RESET_L	36
10	GND		
10	GND		
15 128	IO_AON_TO_AP_XTAL_CFSB	IO_AON_TO_AP_XTAL_CFSB	10
100	90_EUSB_DBG_PARROT_BI_AP_N	90_EUSB_DBG_PARROT_BI_AP_N	15
100	90_EUSB_DBG_PARROT_BI_AP_P	90_EUSB_DBG_PARROT_BI_AP_P	15
15	NC_TP_SOC_KIS_REQUEST_DFU	NC_TP_SOC_KIS_REQUEST_DFU	NO_TEST=TRUE
15	NC_TP_SOC_KIS_RESET	NC_TP_SOC_KIS_RESET	NO_TEST=TRUE
23	GND		

VSS CORNER BALLS

23	GND
23	GND
23	GND
23	GND

DISPLAY

13	NC_SOC_DWI_CLK	NC_SOC_DWI_CLK	NO_TEST=TRUE
13	NC_SOC_DWI_DATA	NC_SOC_DWI_DATA	NO_TEST=TRUE
13	NC_SOC_DISP_I2C_SCL	NC_SOC_DISP_I2C_SCL	NO_TEST=TRUE
13	NC_SOC_DISP_I2C_SDA	NC_SOC_DISP_I2C_SDA	NO_TEST=TRUE
13	NC_SOC_DISP_POL	NC_SOC_DISP_POL	NO_TEST=TRUE
13	NC_SOC_DISP_EXT_HPD	NC_SOC_DISP_EXT_HPD	NO_TEST=TRUE
13	NC_SOC_DISP_TOUCH_EB	NC_SOC_DISP_TOUCH_EB	NO_TEST=TRUE

ATCPHY

10	90_ATC0_EUSB_PARROT_BI_AP_P	90_ATC0_EUSB_PARROT_BI_AP_P
10	90_ATC0_EUSB_PARROT_BI_AP_N	90_ATC0_EUSB_PARROT_BI_AP_N

ISP

12	NC_ISP_GPIO_1	NC_ISP_GPIO_1	NO_TEST=TRUE
12	NC_ISP_GPIO_2	NC_ISP_GPIO_2	NO_TEST=TRUE
12	NC_ISP_GPIO_3	NC_ISP_GPIO_3	NO_TEST=TRUE

AP SPI

14	SPI0_AP_FROM_NAND_MISO_BOOT_CONFIG2	SPI0_AP_FROM_NAND_MISO_BOOT_CONFIG2	8 31
14	SPI0_AP_TO_NAND_MOSI_BOOT_CONFIG1	SPI0_AP_TO_NAND_MOSI_BOOT_CONFIG1	8 31
14	SPI0_AP_TO_NAND_SCLK_BOOT_CONFIG0	SPI0_AP_TO_NAND_SCLK_BOOT_CONFIG0	8 31
14	NC_SPI1_MISO_AP	NC_SPI1_MISO_AP	NO_TEST=TRUE
14	NC_SPI1_MOSI_AP	NC_SPI1_MOSI_AP	NO_TEST=TRUE
14	NC_SPI1_SCLK_AP	NC_SPI1_SCLK_AP	NO_TEST=TRUE
	NC_SPI1_SCLK_AP		
14	NC_SPI1_CS_L_AP	NC_SPI1_CS_L_AP	NO_TEST=TRUE
14	NC_SPI2_MISO_AP	NC_SPI2_MISO_AP	NO_TEST=TRUE
14	NC_SPI2_MOSI_AP	NC_SPI2_MOSI_AP	NO_TEST=TRUE
14	NC_SPI2_SCLK_AP	NC_SPI2_SCLK_AP	NO_TEST=TRUE
	NC_SPI2_SCLK_AP		
14	NC_SPI2_CS_L_AP	NC_SPI2_CS_L_AP	NO_TEST=TRUE
14	SPI3_AP_FROM_CODEC_MISO	SPI3_AP_FROM_CODEC_MISO	79 128
14	SPI3_AP_TO_CODEC_MOSI	SPI3_AP_TO_CODEC_MOSI	79 128
14	SPI3_AP_TO_CODEC_SCLK	SPI3_AP_TO_CODEC_SCLK	79
14	SPI3_AP_TO_CODEC_CS_L	SPI3_AP_TO_CODEC_CS_L	79 128

NUB

10	NC_SOC_SWD_TMS7	NC_SOC_SWD_TMS7 NO_TEST=TRUE

PP1V24_S2 — 27 35 39 96 102 504

R2701 47K 1% 1/32W TK 1005 ROOM=B2B_SMP 118500347

26 507 GPIO_NUB_FROM_BANFF_B2B_DETECT_L

MTP

92	GPIO_NUB_TO_TOUCH_RESET_L	GPIO_NUB_TO_TOUCH_RESET_L 26 117

Serial UART

14	UART0_AP_TO_ACE_DEBUG_TXD	UART0_AP_TO_ACE_DEBUG_TXD	96 126
14	UART0_AP_FROM_ACE_DEBUG_RXD	UART0_AP_FROM_ACE_DEBUG_RXD	96 126
14	NC_UART1_AP_CTS_L	NC_UART1_AP_CTS_L	NO_TEST=TRUE
14	NC_UART1_AP_RTS_L	NC_UART1_AP_RTS_L	NO_TEST=TRUE
14	GPIO_ACE_DEBUG_GPIO0_TO_UART1_AP_RXD	GPIO_ACE_DEBUG_GPIO0_TO_UART1_AP_RXD	103 128
14	NC_UART1_AP_TXD	NC_UART1_AP_TXD	NO_TEST=TRUE
14	NC_UART2_AP_CTS_L	NC_UART2_AP_CTS_L	NO_TEST=TRUE
14	NC_UART2_AP_RTS_L	NC_UART2_AP_RTS_L	NO_TEST=TRUE
14	NC_UART2_AP_RXD	NC_UART2_AP_RXD	NO_TEST=TRUE
14	NC_UART2_AP_TXD	NC_UART2_AP_TXD	NO_TEST=TRUE
14	NC_UART3_AP_CTS_L	NC_UART3_AP_CTS_L	NO_TEST=TRUE
14	NC_UART3_AP_RTS_L	NC_UART3_AP_RTS_L	NO_TEST=TRUE
14	NC_UART3_AP_RXD	NC_UART3_AP_RXD	NO_TEST=TRUE
14	NC_UART3_AP_TXD	NC_UART3_AP_TXD	NO_TEST=TRUE
14	NC_UART4_AP_TXD	NC_UART4_AP_TXD	NO_TEST=TRUE
14	NC_UART4_AP_RXD	NC_UART4_AP_RXD	NO_TEST=TRUE

AOP SPI1

16	SPI1_AOP_TO_GNSS_SCLK	SPI1_AOP_TO_GNSS_SCLK	504
	SPI1_AOP_TO_GNSS_SCLK_R	SPI1_AOP_TO_GNSS_SCLK_R	
16	SPI1_AOP_FROM_GNSS_MISO	SPI1_AOP_FROM_GNSS_MISO	504
16	SPI1_AOP_TO_GNSS_MOSI	SPI1_AOP_TO_GNSS_MOSI	504

Serial I2S

16	NC_I2S4_AOP_DIN	NC_I2S4_AOP_DIN	NO_TEST=TRUE
16	NC_I2S4_AOP_DOUT	NC_I2S4_AOP_DOUT	NO_TEST=TRUE
16	NC_I2S4_AOP_BCLK	NC_I2S4_AOP_BCLK	NO_TEST=TRUE
16	NC_I2S4_AOP_LRCK	NC_I2S4_AOP_LRCK	NO_TEST=TRUE
16	NC_I2S5_AOP_DIN	NC_I2S5_AOP_DIN	NO_TEST=TRUE
16	NC_I2S5_AOP_DOUT	NC_I2S5_AOP_DOUT	NO_TEST=TRUE
16	NC_I2S5_AOP_BCLK	NC_I2S5_AOP_BCLK	NO_TEST=TRUE
16	NC_I2S5_AOP_LRCK	NC_I2S5_AOP_LRCK	NO_TEST=TRUE

18	NC_ANALOG_PCPU_ABSMIN	NC_ANALOG_PCPU_ABSMIN	NO_TEST=TRUE

AOP

15	GND		
15	NC_DEV_JTAG_TDI	NC_DEV_JTAG_TDI	NO_TEST=TRUE
15	NC_DEV_JTAG_TDO	NC_DEV_JTAG_TDO	NO_TEST=TRUE
15	NC_DEV_JTAG_TRST_L	NC_DEV_JTAG_TRST_L	NO_TEST=TRUE
15	PP1V24_S2	PP1V24_S2	27 35 39 96 102 504
15	NC_DEV_SOC_NUB_CLK_OUT0	NC_DEV_SOC_NUB_CLK_OUT0	NO_TEST=TRUE
15	SOC_NUB_CLK_OUT1	SOC_NUB_CLK_OUT1	129

Apple Proprietary and Confidential

PAGE TITLE: SOC: Aliases: Misc (27)

DRAWING NUMBER | SIZE

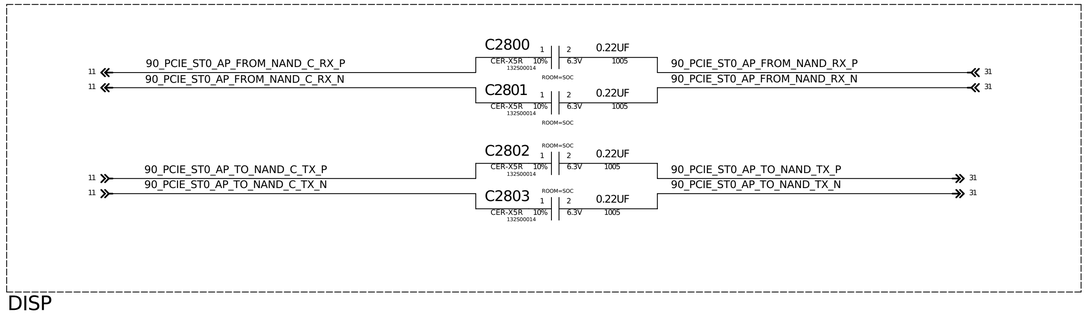
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

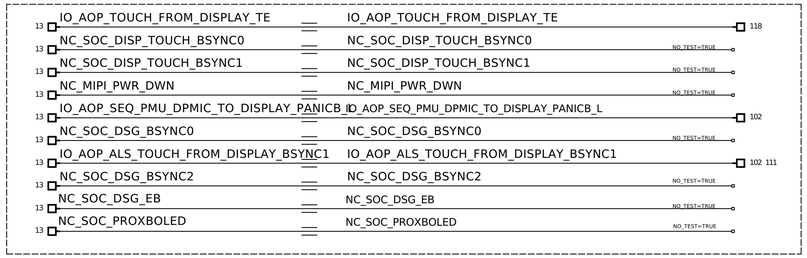
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

PCIe ST0

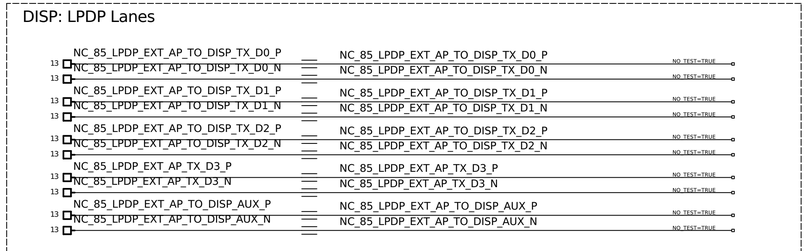


DISP

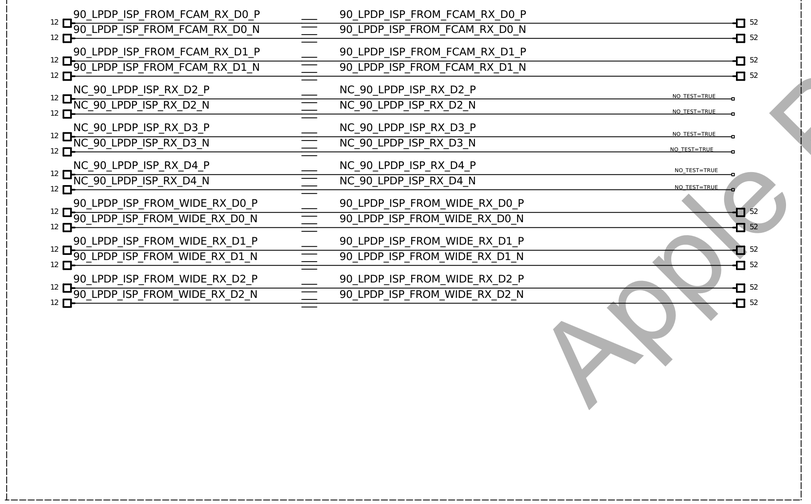


LPDP

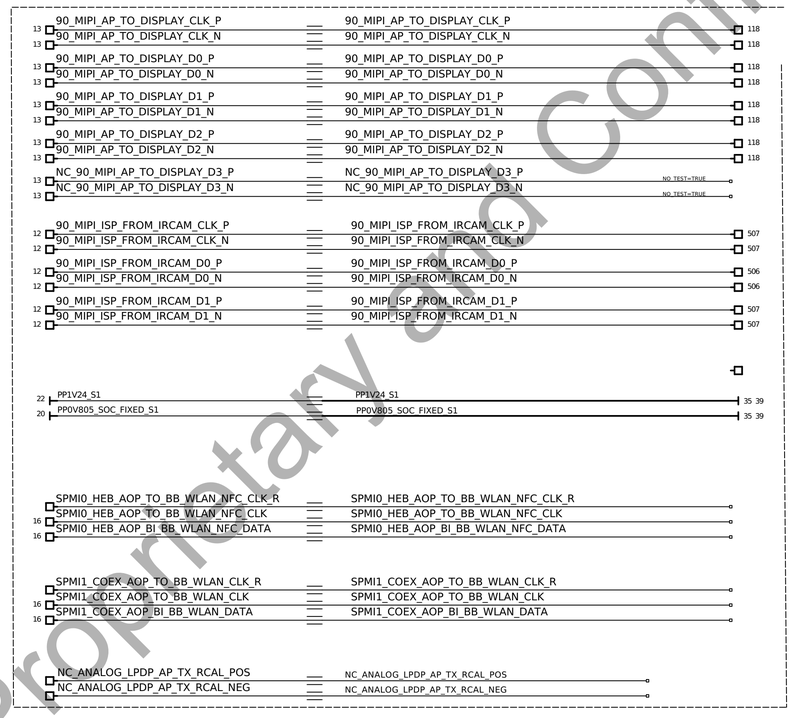
DISP: LPDP Lanes



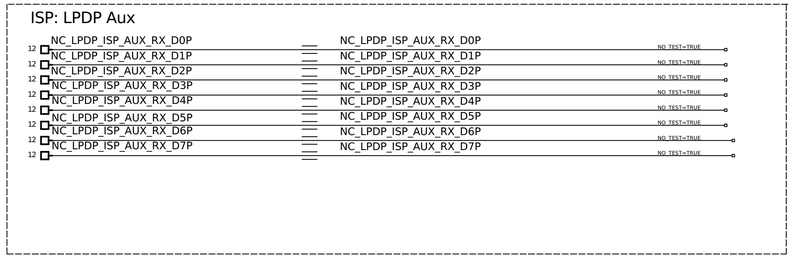
ISP: LPDP Lanes

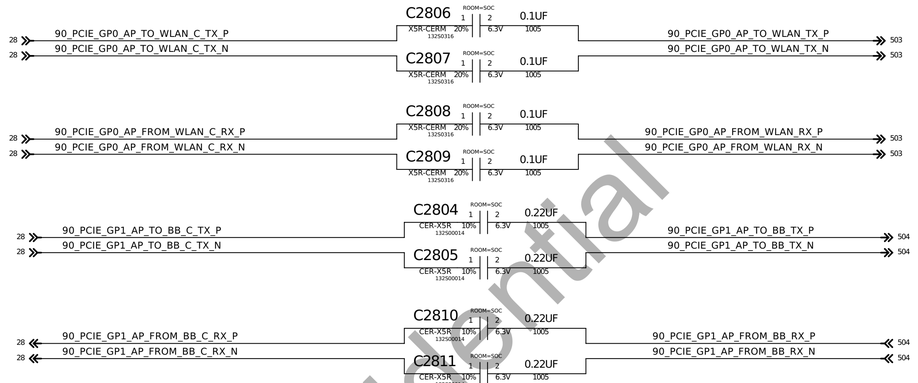


MISC

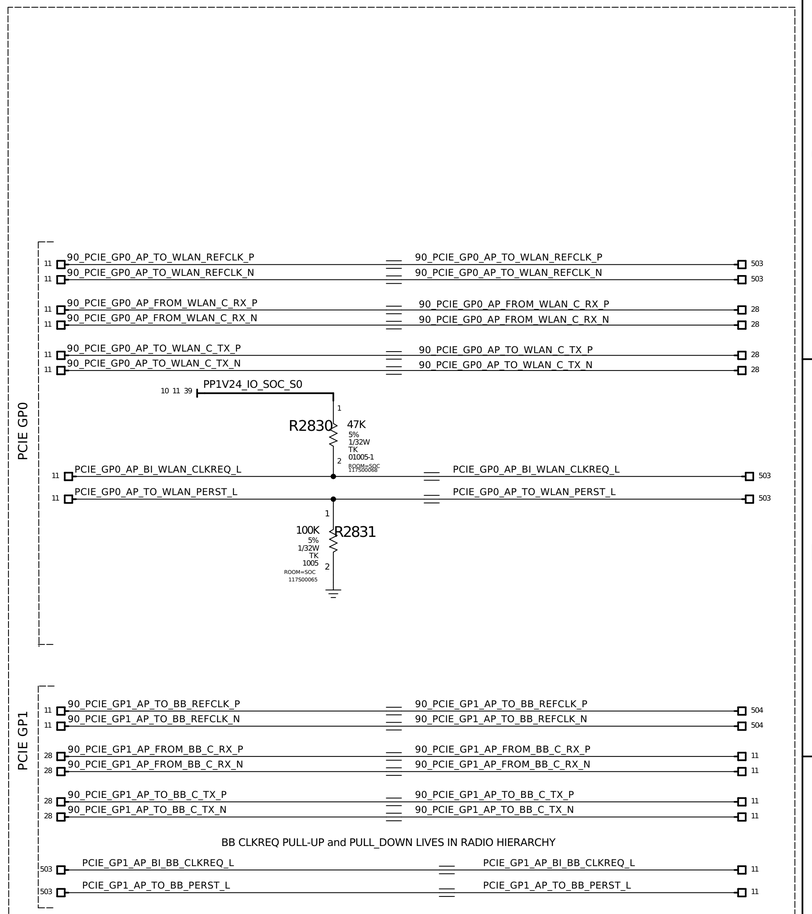


ISP: LPDP Aux





PCIe GPx



Apple Proprietary & Confidential

PAGE TITLE

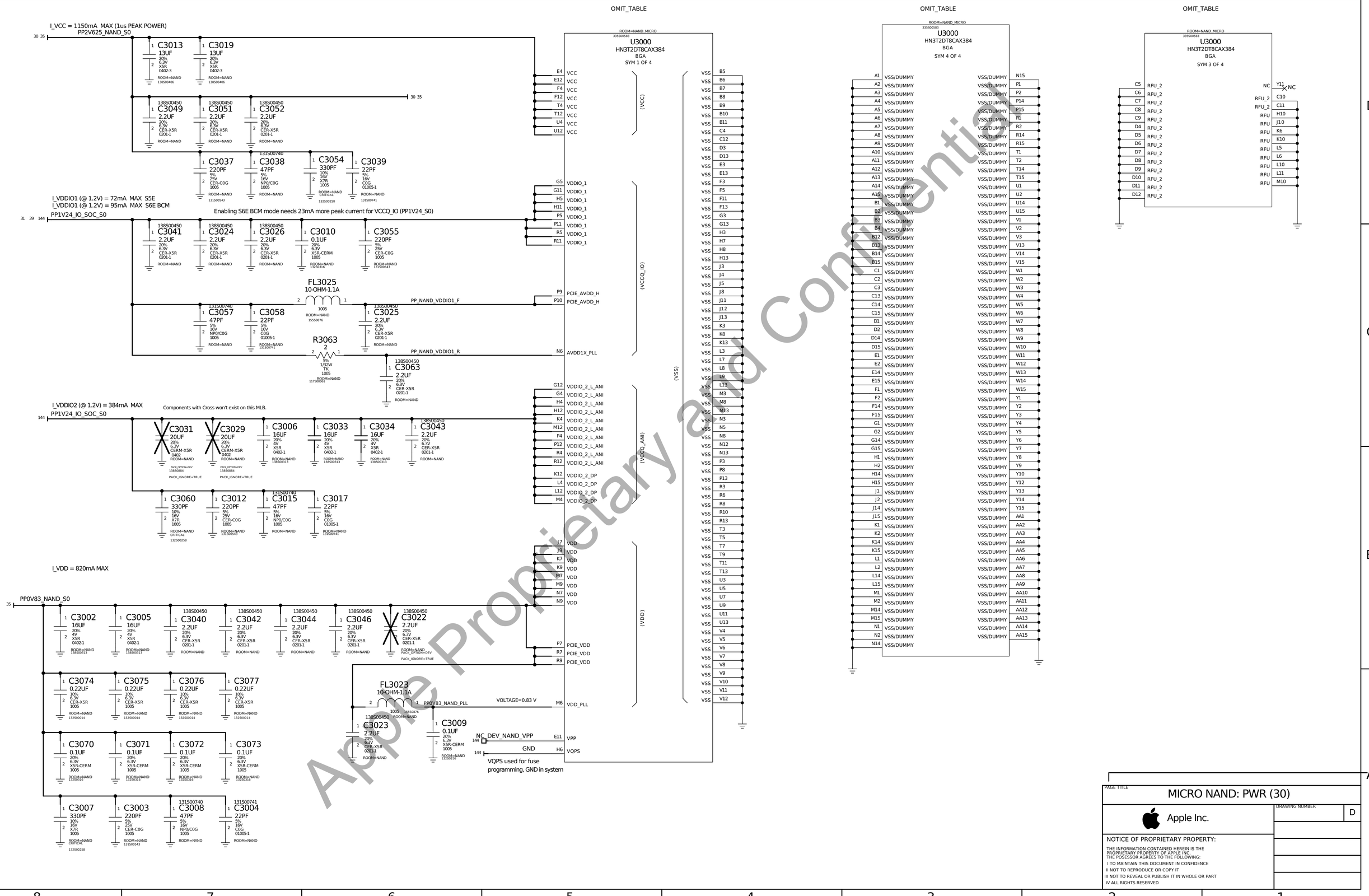
SOC: Aliases: FF-Specific (28)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

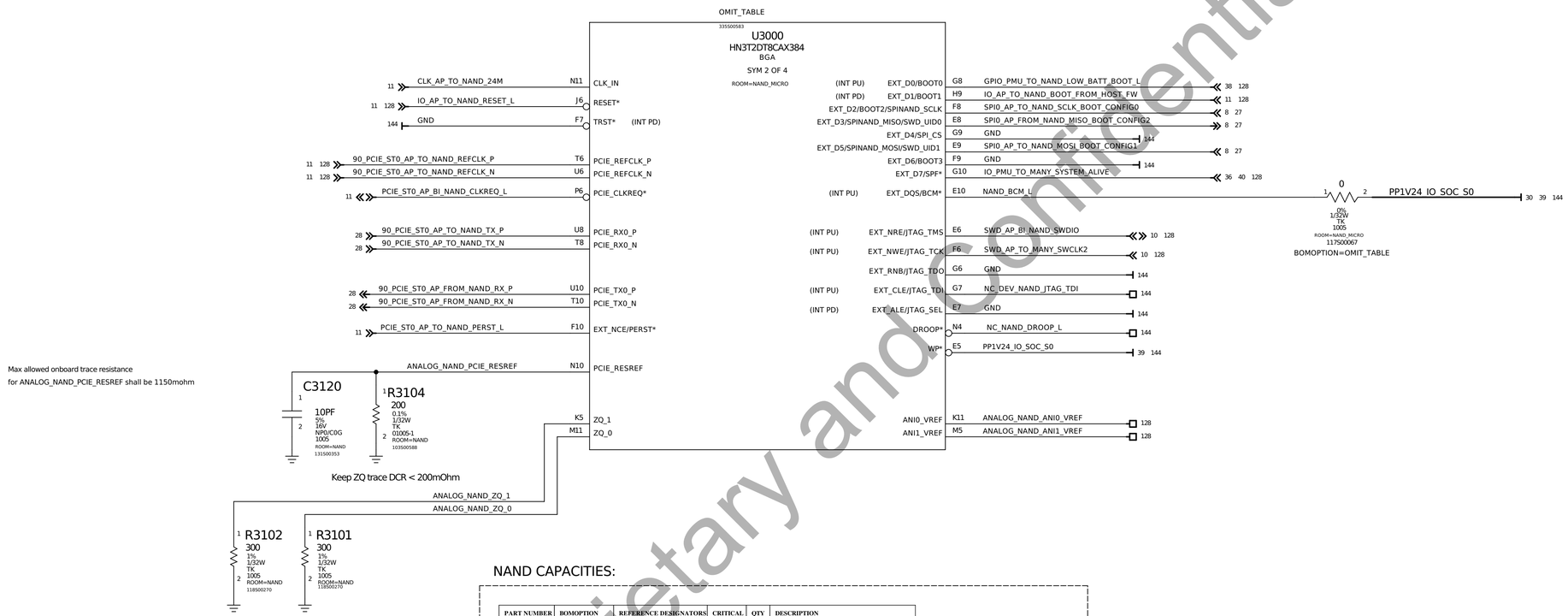
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED


OMIT_TABLE
OMIT_TABLE
OMIT_TABLE
I_VCC = 1150mA MAX (1us PEAK POWER)
PP2V625_NAND_S0
U3000
HN3T2DT8CAX384
BGA
SYM 1 OF 4
SYM 4 OF 4
SYM 3 OF 4
ROOM=NAND_MICRO
335500583
I_VDDIO1 (@ 1.2V) = 72mA MAX S5E
I_VDDIO1 (@ 1.2V) = 95mA MAX S6E BCM
PP1V24_IO_SOC_S0
Enabling S6E BCM mode needs 23mA more peak current for VCCQ_IO (PP1V24_S0)
FL3025
10-OHM-1.1A
PP_NAND_VDDIO1_F
PP_NAND_VDDIO1_R
R3063
2
I_VDDIO2 (@ 1.2V) = 384mA MAX
PP1V24_IO_SOC_S0
Components with Cross won't exist on this MLB.
I_VDD = 820mA MAX
PP0V83_NAND_S0
FL3023
10-OHM-1.1A
PP0V83_NAND_PLL
VOLTAGE=0.83 V
NC_DEV_NAND_VPP
GND
VQPS used for fuse
programming, GND in system
(VCC)
(VCCQ_IO)
(VSS)
(VCCQ_ANI)
(VDD)
VCC
VDDIO_1
VDDIO_2_L_ANI
VDDIO_2_DP
VDD
PCIE_AVDD_H
PCIE_VDD
AVDD1X_PLL
VDD_PLL
VPP
VQPS
VSS/DUMMY
RFU_2
RFU
NC
C3013 13UF
C3019 13UF
C3049 2.2UF
C3051 2.2UF
C3052 2.2UF
C3037 220PF
C3038 47PF
C3054 330PF
C3039 22PF
C3041 2.2UF
C3024 2.2UF
C3026 2.2UF
C3010 0.1UF
C3055 220PF
C3057 47PF
C3058 22PF
C3025 2.2UF
C3063 2.2UF
C3031 20UF
C3029 20UF
C3006 16UF
C3033 16UF
C3034 16UF
C3043 2.2UF
C3060 330PF
C3012 220PF
C3015 47PF
C3017 22PF
C3002 16UF
C3005 16UF
C3040 2.2UF
C3042 2.2UF
C3044 2.2UF
C3046 2.2UF
C3022 2.2UF
C3074 0.22UF
C3075 0.22UF
C3076 0.22UF
C3077 0.22UF
C3070 0.1UF
C3071 0.1UF
C3072 0.1UF
C3073 0.1UF
C3023 2.2UF
C3009 0.1UF
C3007 330PF
C3003 220PF
C3008 47PF
C3004 22PF
Apple Proprietary and Confidential
PAGE TITLE
MICRO NAND: PWR (30)
DRAWING NUMBER
D
Apple Inc.
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

S5E/S6E NAND

NOTES:

INT PU = internal pull up to VDDIO_1
INT PD = internal pull down to VSS
Internal pulls are 40kOhm (min), 80kOhm (typ), 165kOhm (max)



Max allowed onboard trace resistance
for ANALOG_NAND_PCIE_RESREF shall be 1150mohm

Keep ZQ trace DCR < 200mOhm

NAND CAPACITIES:

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
335S00579	NAND:SUPREME	U3000	C	1	NAND,3DV7T,128GB,S5E,17.0,512G,H,ULGA315
335S00581	NAND:EXTREME	U3000	C	1	NAND,3DV7T,256GB,S5E,17.0,512G,H,ULGA315
335S00583	NAND:MAX	U3000	C	1	NAND,3DV7T,512GB,S5E,17.0,512G,H,ULGA315

ALTERNATE PART NO.	PRIMARY PART NO.	BOMOPTION	REFERENCE DESIGNATORS	COMMENT
335S00551	335S00579	NAND:SUPREME	U3000	KIOXIA,BiCS5,128GB,SUPREME
335S00635	335S00581	NAND:EXTREME	U3000	SMSG,BiCS8,256GB,EXTREME
335S00665	335S00581	NAND:EXTREME	U3000	KIOXIA,BiCS8,256GB,EXTREME
335S00553	335S00583	NAND:MAX	U3000	KIOXIA,BiCS5,512GB,MAX

S6E NAND:

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
335S00673	NAND:S6EEXTREME	U3000	C	1	NAND,BC8T,512GB,S6E,XXX,1T,K,ULGA315
117500067	NAND:S6EEXTREME	R3100	C	1	RES,TK,0 OHM,1/32W,01005

Apple Proprietary and Confidential

PAGE TITLE
MICRO NAND: I/O (31)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

OUTPUTS

BUCK4 — 2.9A MAX

PP1V1_VDD2H_DDR_S2 — VOLTAGE=1.1 V — (DEFAULT, DVC = 0.98V - 1.05V)

C3345 4UF 20% 6.3V CER-X5R 201 — ROOM=PMU — 138S0071
C3344 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3343 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3342 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3341 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3340 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170

L3340 0.47UH-20%-4.0A-0.05OHM
PP1V1_VDD2H_DDR_S2 — PACK_OPTION=MLB — PJID2012-SM ROOM=PMU 152S00985 — LX_BUCK4 DIDT=TRUE

XW3340 SHORT-20L-0.05MM-SM — ROOM=PMU — NO_XNET_CONNECTION — 998-03569
ANALOG_FB_BUCK4 — PACK_OPTION=MLB

A12 BUCK4_LX
B12 BUCK4_LX
D12 BUCK4_FB
C12 BUCK4_VSS_FB

BUCK5 — 2.5A MAX

PP_AVE_S0 — (0.605V - 0.762V)

BUCK5 enabled/ disabled as needed in S0 state

C3351 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3350 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3352 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170

L3350 0.47UH-20%-4.0A-0.05OHM
PP_AVE_S0 — PACK_OPTION=MLB — PJID2012-SM ROOM=PMU 152S00985 — LX_BUCK5 DIDT=TRUE

XW3350 SHORT-20L-0.05MM-SM — ROOM=PMU — NO_XNET_CONNECTION — 998-03569
ANALOG_FB_BUCK5
MID-PLANE FEEDBACK
PACK_OPTION=MLB

A14 BUCK5_LX
B14 BUCK5_LX
D14 BUCK5_FB
C14 BUCK5_VSS_FB

BUCK6 — 3A MAX

PP1V24_S4 — 142 503 506 — VOLTAGE=1.24 V — (DEFAULT)

C3365 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3364 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3363 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3362 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3361 4UF 20% 6.3V CER-X5R 201 — ROOM=PMU — 138S00071
C3360 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170

L3360 0.47UH-20%-4.0A-0.05OHM
PP1V24_S4 — PACK_OPTION=MLB — PJID2012-SM ROOM=PMU 152S00985 — LX_BUCK6 DIDT=TRUE

XW3360 SHORT-20L-0.05MM-SM — ROOM=PMU — NO_XNET_CONNECTION — 998-03569
ANALOG_FB_BUCK6
LOCAL FEEDBACK

W4 BUCK6_LX
Y4 BUCK6_LX
U4 BUCK6_FB
V4 BUCK6_VSS_FB

BUCK7 — 3A MAX

PP_SRAM_S2

C3373 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3372 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3371 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3370 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170

L3370 0.47UH-20%-4.0A-0.05OHM
PP_SRAM_S2 — PACK_OPTION=MLB — PJID2012-SM ROOM=PMU 152S00985 — LX_BUCK7 DIDT=TRUE

XW3370 SHORT-20L-0.05MM-SM — ROOM=PMU — NO_XNET_CONNECTION — 998-03569
ANALOG_FB_BUCK7
MID-PLANE FEEDBACK

T18 BUCK7_LX
T19 BUCK7_LX
T16 BUCK7_FB
T17 BUCK7_VSS_FB

BUCK8 — 3.0A MAX

PP_DISP_S1 — (0.625V - 0.682V)

C3383 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3380 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170

L3380 0.47UH-20%-4.0A-0.05OHM
PP_DISP_S1 — PACK_OPTION=MLB — PJID2012-SM ROOM=PMU 152S00985 — LX_BUCK8 DIDT=TRUE

XW3380 SHORT-20L-0.05MM-SM — 998-03569 — ROOM=PMU — NO_XNET_CONNECTION
ANALOG_FB_BUCK8
SOC FEEDBACK
PACK_OPTION=MLB

W6 BUCK8_LX
Y6 BUCK8_LX
U6 BUCK8_FB
V6 BUCK8_VSS_FB

BUCK9 — 0.25A MAX

VOLTAGE=1.0 V — PP1VX_DISPLAY_S0 — I_LOAD = 0.2A (MAX)

C3392 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3391 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3393 10UF 20% 10V X5R-CERM 0402-8 — ROOM=PMU — 138S0979
C3390 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170

L3390 1.0UH-20%-1.55A-0.063OHM
PP1VX_DISPLAY_S0 — PACK_OPTION=MLB — PJID2012-SM ROOM=PMU 152S00987 — LX_BUCK9 DIDT=TRUE

XW3390 SHORT-20L-0.05MM-SM — 998-03569 — ROOM=PMU — NO_XNET_CONNECTION — 998-03569
ANALOG_FB_BUCK9
LOCAL FEEDBACK
PLACE_NEAR=C3391.1:2MM

A2 BUCK9_LX
B2 BUCK9_LX
D2 BUCK9_FB
C2 BUCK9_VSS_FB

BUCK9 NOTES:
1. PP1VX_DISPLAY_S2' is default OFF
2. For PP1VX_DISPLAY_S2, the nominal voltage is between 1.0V to 1.15V depending on program and display

OMIT_TABLE

U3300 BAKU-STUDY WLCSP SYM 1 OF 6 ROOM=PMU — 998-25286

BUCK4 | BUCK5 | BUCK6 | BUCK7 | BUCK8 | BUCK9

OUTPUTS

BUCK0 — 13.8A MAX

L3300 1UH-20%-3.0A-0.06OHM
BUCK0_LX_PH0 — F19 — LX_BUCK0_P0 DIDT=TRUE — PJIR2016-5M ROOM=PMU 152S00823 — PP_CPU_PCORE_S0 PACK_OPTION=MLB

L3301 0.1UH-20%-6.1A-0.019OHM MTFE2016-2SM 152S00897
B18 LX_BUCK0_P2 DIDT=TRUE — BUCK0_LX_PH2 B19 — UPPER_COIL_IN — UPPER_COIL_OUT
D18 — BUCK0_LX_PH3 D19 — LX_BUCK0_P3 DIDT=TRUE — LOWER_COIL_IN — LOWER_COIL_OUT — ROOM=PMU

L3302 0.1UH-20%-6.1A-0.019OHM MTFE2016-2SM 152S00897
H18 LX_BUCK0_P4 DIDT=TRUE — BUCK0_LX_PH4 H19 — UPPER_COIL_IN — UPPER_COIL_OUT
K18 — BUCK0_LX_PH5 K19 — LX_BUCK0_P5 DIDT=TRUE — LOWER_COIL_IN — LOWER_COIL_OUT — ROOM=PMU

XW3301 SHORT-20L-0.05MM-SM 998-03569 — ROOM=SOC — NO_XNET_CONNECTION
BUCK0_FB — G16 — ANALOG_FB_BUCK0
BUCK0_VSS_FB — H16
SOC FEEDBACK
PACK_OPTION=MLB

PP_CPU_PCORE_S0 — (0.524V - 1.06V) — 39

C3300 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170
C3301 100PF 5% 16V C0G 01005 — ROOM=PMU — 131S00730
C3303 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313

BUCK1 — 10.0A MAX

BUCK1_LX_PH0 — W9 — LX_BUCK1_P0 DIDT=TRUE — LOWER_COIL_IN — LOWER_COIL_OUT — PACK_OPTION=MLB
BUCK1_LX_PH1 — W11 — UPPER_COIL_IN — UPPER_COIL_OUT — Y11 — LX_BUCK1_P1 DIDT=TRUE — ROOM=PMU

XW3310 SHORT-20L-0.05MM-SM 998-03569 — ROOM=PMU — NO_XNET_CONNECTION
BUCK1_FB — U11 — ANALOG_FB_BUCK1
BUCK1_VSS_FB — U12
SOC FEEDBACK
PACK_OPTION=MLB

PP_GPU_S0 — (0.57V - 0.9V) — 39

BUCK1 enabled/ disabled as needed in S0 state

C3310 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170
C3311 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313
C3312 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170

BUCK2 — 11A MAX

XW3312 SHORT-20L-0.05MM-SM 998-03569 — ROOM=SOC — NO_XNET_CONNECTION
ANALOG_FB_BUCK1_VSS
SOC FEEDBACK

L3320 1UH-20%-3.0A-0.06OHM
BUCK2_LX_PH0 — Y14 — LX_BUCK2_P0 DIDT=TRUE — PJIR2016-5M ROOM=PMU 152S00823 — PP_SOC_S1P5 PACK_OPTION=MLB

L3321 0.22UH-20%-5.8A-0.04OHM
BUCK2_LX_PH2 — W16 — Y16 — LX_BUCK2_P2 DIDT=TRUE — ROOM=PMU 152S00818 — PP_SOC_S1P5

L3322 0.22UH-20%-5.8A-0.04OHM
BUCK2_LX_PH3 — W18 — Y18 — LX_BUCK2_P3 DIDT=TRUE — ROOM=PMU 152S00818 — PP_SOC_S1P5

XW3320 SHORT-20L-0.05MM-SM
BUCK2_FB — U14 — ANALOG_FB_BUCK2
BUCK2_VSS_FB — V14
MID-PLANE FEEDBACK
PACK_OPTION=MLB 998-03569

PP_SOC_S1P5 — (0.614V - 0.833V) — 39

C3320 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170
C3321 16UF 20% 4V X5R 0402-1 — ROOM=PMU — 138S00313

BUCK3 — 2A MAX

L3330 0.47UH-20%-4.0A-0.05OHM
BUCK3_LX — W2 — Y2 — LX_BUCK3 DIDT=TRUE — PJID2012-SM ROOM=PMU 152S00985 — PP1V825_S4 PACK_OPTION=MLB

XW3330 SHORT-20L-0.05MM-SM — ROOM=PMU — NO_XNET_CONNECTION — 998-03569
BUCK3_FB — V2 — ANALOG_FB_BUCK3
BUCK3_VSS_FB — U2
LOCAL FEEDBACK

PP1V825_S4 — 39 126 503 504 506

C3330 220PF 5% 25V COG 1005 — ROOM=PMU — 131S00170
C3331 10UF 20% 10V X5R-CERM 0402-8 — ROOM=PMU — 138S0979
C3332 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3334 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3335 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313
C3336 16UF 20% 4V X5R 0402-0.1MM-1 — ROOM=PMU — 138S00313

Apple Proprietary and Confidential

PAGE TITLE
SYS PWR: PMU: Bucks (1/5) (33)

Apple Inc.

DRAWING NUMBER — D

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

INPUTS

PP_VDD_MAIN

PLACE IN VICINITY OF PMU FOR BULK CAP

C3406 13UF 20% 6.3V X5R 0402-3 ROOM=PMU — 138S00406
C3407 13UF 20% 6.3V X5R 0402-3 ROOM=PMU — 138S00406

C3475 220PF 5% 25V COG 1005 ROOM=PMU — 131S00170
C3476 220PF 5% 25V COG 1005 ROOM=PMU — 131S00170

C3482 220PF 5% 25V COG 1005 ROOM=PMU — 131S00170
C3485 330PF 10% 16V X7R 1005 ROOM=PMU — 132S00258
C3486 330PF 10% 16V X7R 1005 ROOM=PMU — 132S00258
C3487 220PF 5% 25V COG 1005 ROOM=PMU — 131S00170

C3478 220PF 5% 25V COG 1005 ROOM=PMU — 131S00170
C3479 220PF 5% 25V COG 1005 ROOM=PMU — 131S00170

OMIT_TABLE

U3300
BAKU-STUDY
WLCSP
SYM 2 OF 6
ROOM=PMU
998-25286

TOP SIDE BUCK INPUTS

	A1	VSS_BUCK9
C3450 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	B1	VSS_BUCK9
		BUCK9_LX
	A3	VDD_BUCK12_9
C3498 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	B3	VDD_BUCK12_9
		BUCK12_LX
	A5	VSS_BUCK13_12
C3459 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	B5	VSS_BUCK13_12
		BUCK13_LX
	A7	VDD_BUCK13_10_4
C3441 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	B7	VDD_BUCK13_10_4
		BUCK10_LX_PH2
	A9	VSS_BUCK10
C3497 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	B9	VSS_BUCK10
		BUCK10_LX_PH1
	A11	VDD_BUCK13_10_4
C3454 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	B11	VDD_BUCK13_10_4
		BUCK4_LX
	A13	VSS_BUCK5_4
C3499 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU 138S00450	B13	VSS_BUCK5_4
C3455 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014		BUCK5_LX
	A15	VDD_BUCK5
	B15	VDD_BUCK5

BOTTOM SIDE BUCK INPUT

	A19	VSS_BUCK0
C3492 2.2UF 0201-1 CER-X5R 6.3V 20% ROOM=PMU 138S00450	A18	VSS_BUCK0
C3456 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	A17	VSS_BUCK0
		BUCK0_LX_PH2
	C19	VDD_BUCK11_7_0
C3457 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	C18	VDD_BUCK11_7_0
		BUCK0_LX_PH3
	E19	VSS_BUCK0
C3469 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	E18	VSS_BUCK0
		BUCK0_LX_PH0
	G19	VDD_BUCK11_7_0
C3451 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	G18	VDD_BUCK11_7_0
		BUCK0_LX_PH4
	J19	VSS_BUCK0
C3491 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU 138S00450	J18	VSS_BUCK0
C3460 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014		BUCK11_LX_PH5
	L19	VDD_BUCK11_7_0
C3470 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	L18	VDD_BUCK11_7_0
		BUCK11_LX_PH2
	N19	VSS_BUCK11
C3442 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	N18	VSS_BUCK11
		BUCK11_LX_PH0
	R19	VDD_BUCK11_7_0
C3496 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	R18	VDD_BUCK11_7_0
		BUCK7_LX
	U19	VSS_BUCK7
	U18	VSS_BUCK7

RIGHT SIDE BUCK INPUTS

	V19	VSS_BUCK2
C3458 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU 138S00450	Y15	VSS_BUCK2
C3473 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	W15	VSS_BUCK2
		BUCK2_LX_PH3
	W17	VDD_BUCK8_2_1
C3464 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	Y17	VDD_BUCK8_2_1
		BUCK2_LX_PH2
	W19	VSS_BUCK2
C3471 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	Y19	VSS_BUCK2
		BUCK2_LX_PH0
	W13	VDD_BUCK8_2_1
	Y13	VDD_BUCK8_2_1
	W12	VDD_BUCK8_2_1
	Y12	VDD_BUCK8_2_1
		BUCK1_LX_PH1
C3463 3.9UF 20% 6.3V X5R 0201-1 ROOM=PMU 138S00444	W10	VSS_BUCK1
C3452 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	Y10	VSS_BUCK1
C3472 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014		BUCK1_LX_PH01
	W8	VDD_BUCK8_2_1
C3466 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	Y8	VDD_BUCK8_2_1
	W7	VDD_BUCK8_2_1
	Y7	VDD_BUCK8_2_1
		BUCK8_LX
	W5	VSS_BUCK8_6
C3467 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	Y5	VSS_BUCK8_6
		BUCK6_LX
	W3	VDD_BUCK6_3
C3468 0.22UF 10% 6.3V CER-X5R 1005 ROOM=PMU 132S00014	Y3	VDD_BUCK6_3
		BUCK3_LX
	W1	VSS_BUCK3
	Y1	VSS_BUCK3

OUTPUTS

BUCK10 — 5.5A MAX

BUCK10_LX_PH0 — A10 LX_BUCK10_P0 DIDT=TRUE — L3400 1UH-20%-3.0A-0.06OHM PIJR2016-SM ROOM=PMU 152S00823 — PP_CPU_SRAM_S0 — PACK_OPTION=MLB

(0.77V - 1.1V) PP_CPU_SRAM_S0 39

C3401 220PF 5% 25V COG 1005 ROOM=PMU 131S00170
C3402 16UF 20% 4V X5R 0402-1 ROOM=PMU 138S00313

BUCK10_LX_PH2 — A8 LX_BUCK10_P2 DIDT=TRUE — L3401 0.22UH-20%-5.8A-0.04OHM 1608 ROOM=PMU 152S00818 — PP_CPU_SRAM_S0 — PACK_OPTION=MLB

BUCK10_LX_PH2 — B8

BUCK10_FB — D9 ANALOG_FB_BUCK10 — XW3400 SHORT-20L-0.05MM-SM ROOM=PMU NO_XNET_CONNECTION 998-03569 — SOC FEEDBACK — PACK_OPTION=MLB

BUCK10_VSS_FB — D8

BUCK11 — 5.5A MAX

BUCK11_LX_PH0 — P19 LX_BUCK11_P0 DIDT=TRUE — L3410 1UH-20%-3.0A-0.06OHM PIJR2016-SM ROOM=PMU 152S00823 — PP_CPU_ECORE_S0 — PACK_OPTION=MLB

(0.524V - 0.93V) PP_CPU_ECORE_S0 39

C3411 16UF 20% 4V X5R 0402-1 ROOM=PMU 138S00313
C3412 16UF 20% 4V X5R 0402-1 ROOM=PMU 138S00313
C3410 220PF 5% 25V COG 1005 ROOM=PMU 131S00170

BUCK11_LX_PH2 — M18 LX_BUCK11_P2 DIDT=TRUE — L3411 0.22UH-20%-5.8A-0.04OHM 1608 ROOM=PMU 152S00818 — PP_CPU_ECORE_S0 — PACK_OPTION=MLB

BUCK11_LX_PH2 — M19

BUCK11_FB — N16 ANALOG_FB_BUCK11 — XW3410 SHORT-20L-0.05MM-SM ROOM=PMU NO_XNET_CONNECTION — SOC FEEDBACK — PACK_OPTION=MLB 998-03569

BUCK11_VSS_FB — M16

BUCK12 — 2.8A MAX

BUCK12_LX — A4 LX_BUCK12 DIDT=TRUE — L3420 0.47UH-20%-4.0A-0.05OHM PIJD2012-SM ROOM=PMU 152S00985 — PP0V9_S1 — PACK_OPTION=MLB

VOLTAGE=0.9 V PP0V9_S1 39

C3420 220PF 5% 25V COG 1005 ROOM=PMU 131S00170
C3424 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU 138S00313
C3423 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU 138S00313
C3422 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU 138S00313
C3421 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU 138S00313

BUCK12_LX — B4

BUCK12_FB — D4 ANALOG_FB_BUCK12 — XW3420 SHORT-20L-0.05MM-SM ROOM=PMU NO_XNET_CONNECTION 998-03569 — LOCAL FEEDBACK

BUCK12_VSS_FB — C4

BUCK13 — 2.5A MAX

BUCK13_LX — A6 LX_BUCK13 DIDT=TRUE — L3430 0.47UH-20%-4.0A-0.05OHM PIJD2012-SM ROOM=PMU 152S00985 — PP_DCS_S1 — PACK_OPTION=MLB

(0.605V - 1.02V) PP_DCS_S1 39

C3436 220PF 5% 25V COG 1005 ROOM=PMU 131S00170
C3435 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU 138S00313
C3430 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU 138S00313
C3431 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU 138S00313
C3437 10UF 20% 10V X5R-CERM 0402-8 ROOM=PMU 138S00979

BUCK13_LX — B6

BUCK13_FB — D6 ANALOG_FB_BUCK13 — XW3430 SHORT-20L-0.05MM-SM ROOM=PMU NO_XNET_CONNECTION — PACK_OPTION=MLB 998-03569

BUCK13_VSS_FB — C6

Apple Proprietary and Confidential

PAGE TITLE
SYS PWR: PMU: Bucks (2/5) (34)

Apple Inc.

DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SUBSYSTEM SPECIFIC BOM TABLES

PMU - LDOs

PMU BOM TABLE

PART NUMBER	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
998-32560	U3300	C	1	IC,PMU,BAKU,A1,OTP-QPC,CSP380

INPUTS

OUTPUTS

LDO & Switch

OMIT_TABLE

U3300 998-25286
BAKU-STUDY
WLCSP
SYM 3 OF 6
ROOM=PMU

GROUP 1

PP_VDD_BOOST (39) → E3 VDD_BOOST_LDO; L3 VDD_BOOST_LDO; L2 VDD_BOOST_LDO; M2 VDD_BOOST_LDO; J9 VDD_BOOST
- 138S00071 C3504 4UF 20% 6.3V CER-X5R 201 ROOM=PMU

VDD_BOOST_LDO → VLDO1 L4 → PP3V3_S2 (39) VOLTAGE=3.3 V
VDD_BOOST_LDO → VLDO5 L1 → PP2V625_NAND_S0 (30) VOLTAGE=2.625 V
VDD_BOOST_LDO → VLDO5 M1
VDD_BOOST → VMBX L10 ANALOG_PMU_VMBX_ALWAYS
VDD_BOOST → VCP_OUT M5 ANALOG_PMU_VPUMP_ALWAYS
- C3507 0.1UF 20% 10V X5R 01005-1 ROOM=PMU 132500280
- C3506 0.1UF 20% 10V X5R 01005-1 ROOM=PMU 132500200
- 138S00406 C3510 13UF 20% 6.3V X5R 0402-3 ROOM=PMU (1) PP3V3_S2

GROUP 2

PP_VDD_MAIN (35 39) → H5 VDD_LDO2; K2 VDD_LDO6; K3 VDD_LDO7; J2 VDD_LDO10; J3 VDD_LDO13

VDD_LDO2 → VLDO2 H6 → PP1V8_AUDIO_VA_S2 (79) VOLTAGE=1.8 V
- XW3520 SHORT-20L-0.05MM-SM ROOM=PMU NO_XNET_CONNECTION

VDD_LDO6 → VLDO6 K1 → SPARE_PMU_VLDO6 (39) Not used
VDD_LDO7 → VLDO7 K4 → PP3V0_S2 (39) VOLTAGE=3.0 V
- PACK_OPTION=MLB 998-02569

VDD_LDO10 → VLDO10 J1 → PP3V0_FLICKER_DET_VDD_S0 (503)
VDD_LDO13 → VLDO13 J4 → PP3V15_TOUCH_DISPLAY_S2 (117) VOLTAGE=3.15 V
- 138S00441 C3520 4.3UF 20% 4V X5R 201 ROOM=PMU
- 138S00441 C3524 4.3UF 20% 4V X5R 201 ROOM=PMU (2) PP1V8_AUDIO_VA_S2
- 138S00406 C3501 13UF 20% 6.3V X5R 0402-3 ROOM=PMU (7) PP3V0_S2
- 138S00071 C3515 4UF 20% 6.3V CER-X5R 201 ROOM=PMU (10) PP3V0_REAR_LS
- 138S00071 C3546 4UF 20% 6.3V CER-X5R 201 ROOM=PMU (13) PP3V15_TOUCH_DISPLAY_S2

GROUP 3

PP_VDD_MAIN (35 39) → J5 VDD_MAIN_LDO; K5 VDD_MAIN_LDO; L5 VDD_LDO15
- C3521 0.1UF 20% 6.3V X5R-CERM 1005 ROOM=PMU

VDD_MAIN_LDO → VLDO9 J6 → PP1V8_ALWAYS (36 39) VOLTAGE=1.8 V
VDD_MAIN_LDO → VLDOINT K6 → PP1V5_ALWAYS (37 39) VOLTAGE=1.5 V
VDD_LDO15 → VLDO15 L6 → PPVAR_BARO_S2 (504) VOLTAGE=3.3 V
- C3590 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU (9) PP1V8_ALWAYS
- C3509 16UF 20% 4V X5R 0402-1 ROOM=PMU
- C3508 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU
- C3503 220PF 5% 25V COG 1005 ROOM=PMU (INT) PP1V5_ALWAYS
- 138S00406 C3566 13UF 20% 6.3V X5R 0402-3 ROOM=PMU (15) PPVAR_BARO_S2

GROUP 4

PP1V825_S4 (39) → R2 VIN_SW0; R3 VIN_SW0; R1 VIN_SW1
- C3523 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU

VOUT_SW0 → P2 BUCK3_SW0 VOLTAGE=1.825 V → PP1V825_S2 (39 102 111 503 504 506)
VOUT_SW0 → P3
VOUT_SW1 → P1 BUCK3_SW1 VOLTAGE=1.825 V → PP1V825_S0 (39)

GROUP 5

PP1V24_S4 (39) → G6 VDD_LDO3; G3 VDD_LDO8; F6 VDD_LDO14; F3 VDD_LDO16; N4 VIN_SW2; N2 VIN_SW3; P4 VIN_SW4; P5 VIN_SW4; N3 VIN_SW5

VDD_LDO3 → VLDO3 G5 → PP1V2_LN_SOC_S0 (39) VOLTAGE=1.2 V
VDD_LDO8 → VLDO8 G4 → SPARE_PMU_VLDO8 (39)
VDD_LDO14 → VLDO14 F5 → PP1V2_TOUCH_VDDCORE_S2 (117) VOLTAGE=1.2 V
VDD_LDO16 → VLDO16 F4 → PP1V1_AMPH_S2 (39) VOLTAGE=1.1 V
VOUT_SW2 → M4 BUCK6_SW2 VOLTAGE=1.24 V → PP1V24_NFC_S2 (142)
VOUT_SW3 → N1 BUCK6_SW3 VOLTAGE=1.24 V → PP1V24_S2 (27 39 96 102 504)
VOUT_SW4 → R4 BUCK6_SW4 VOLTAGE=1.24 V → PP1V24_IO_SOC_S0 (39)
VOUT_SW4 → R5
VOUT_SW5 → M3 BUCK6_SW5 VOLTAGE=1.24 V → PP1V24_S1 (28 39)
- 138S00441 C3500 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU
- 138S00313 C3530 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU (3) PP1V2_SOC
- 138S00313 C3555 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU (14) PP1V2_TOUCH_VDDCORE_S2
- 138S00313 C3565 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU (16) PP1V1_AMPH_S2
- 138S00450 C3568 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU (SW2) PP1V2_NFC_S2

* Assumes load cap <80nOhm DCR

GROUP 6

PP_SRAM_S2 (39) → H3 VDD_LDO4
VDD_LDO4 → VLDO4 H4 → PP_VDD_LOW_S2 (39) LDO4: Binned voltage 620mV OTP, Adjusted as low as 560mV

PP0V9_S1 (39) → G2 VDD_LDO11; H2 VDD_LDO12; F2 VDD_LDO17
- 138S00450 C3541 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU NOSTUFF
- C3522 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU 138S00450

PLACE AT LDO11/LDO12 INPUT

VDD_LDO11 → VLDO11 G1 → PP0V5_VDDQL_S1 (39) VOLTAGE=0.5 V
VDD_LDO12 → VLDO12 H1 → PP0V805_SOC_FIXED_S1 (28 39) VOLTAGE=0.805 V
VDD_LDO17 → VLDO17 F1 → PP0V83_NAND_S0 (30) VOLTAGE=0.83 V
- 138S00313 C3540 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU (4) PP_VDD_LOW_S2
- 138S00071 C3527 4UF 20% 6.3V CER-X5R 201 ROOM=PMU
- 138S00313 C3525 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU (11) PP0V5_VDDQL_S1
- 138S00313 C3535 16UF 20% 4V X5R 0402-0.1MM-1 ROOM=PMU (12) PP0V805_SOC_FIXED_S1

* Assumes load cap <80nOhm DCR

PMU LDO Capability:
LDO1 200 mA MAX
LDO5 1300 mA MAX
LDO2 50 mA MAX
LDO6 Not used
LDO7 250 mA MAX
LDO10 50 mA MAX
LDO13 50 mA MAX
LDO9 10 mA MAX
LDO15 100 mA MAX
LDO3 420 mA MAX
LDO8 Not Used
LDO14 150 mA MAX
LDO16 500 mA MAX
BUCK_SW0: 700 mA MAX, 50mOhm MAX
BUCK_SW1: 700 mA MAX, 50mOhm MAX
BUCK_SW2: 200 mA MAX, 125mOhm MAX
BUCK_SW3: 200 mA MAX, 125mOhm MAX
BUCK_SW4: 890 mA MAX, 25mOhm MAX
BUCK_SW5: 150 mA MAX, 125mOhm MAX
LDO4 300 mA MAX
LDO11 850 mA MAX
LDO12 700 mA MAX
LDO17 700 mA MAX

PAGE TITLE
SYS PWR: PMU: LDOs (3/5) (35)

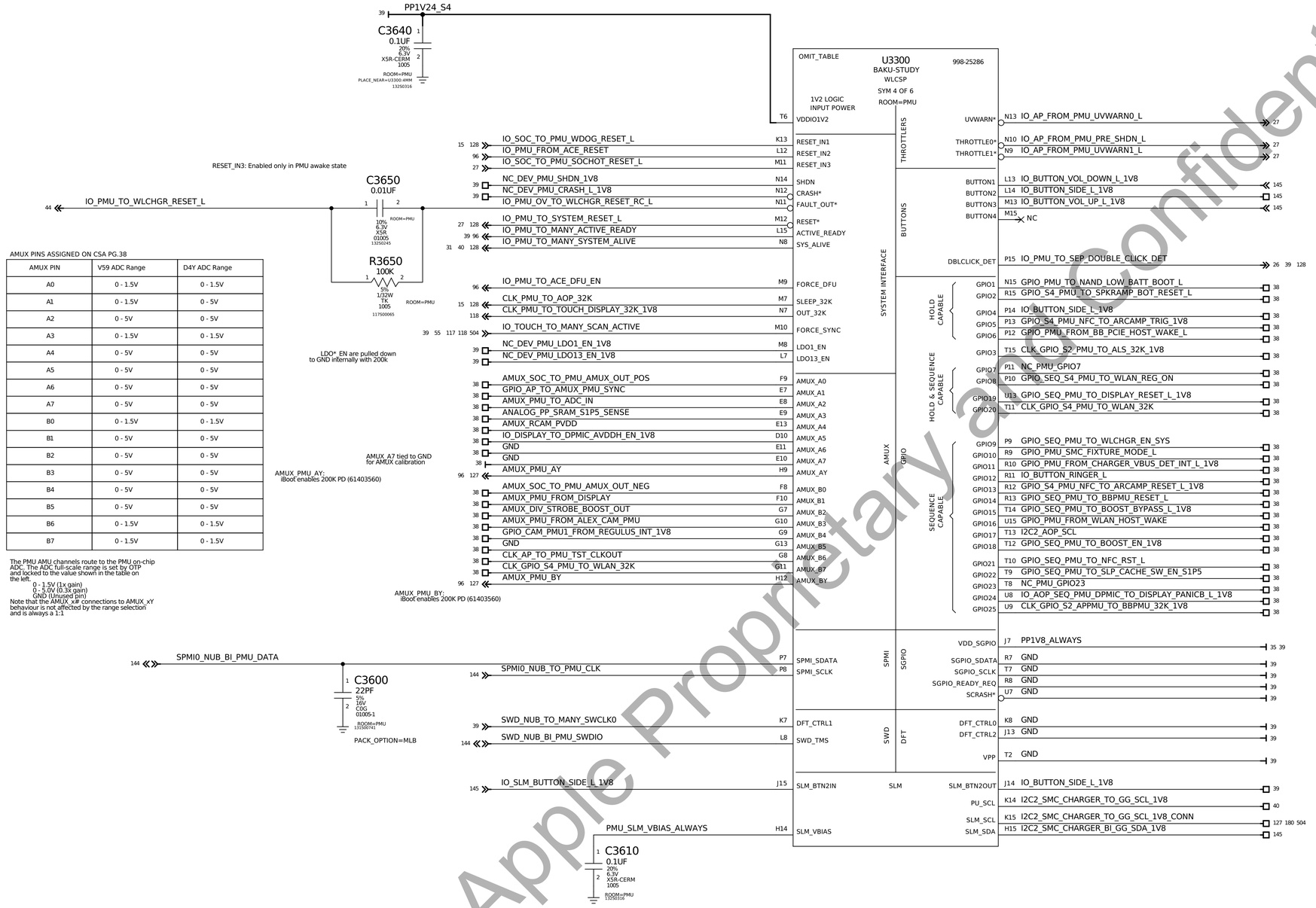
Apple Inc.

DRAWING NUMBER | SIZE

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

PMU - GPIOs + DIOs



AMUX PIN	V59 ADC Range	D4Y ADC Range
A0	0 - 1.5V	0 - 1.5V
A1	0 - 1.5V	0 - 5V
A2	0 - 5V	0 - 5V
A3	0 - 1.5V	0 - 1.5V
A4	0 - 5V	0 - 5V
A5	0 - 5V	0 - 5V
A6	0 - 5V	0 - 5V
A7	0 - 5V	0 - 5V
B0	0 - 1.5V	0 - 1.5V
B1	0 - 5V	0 - 5V
B2	0 - 5V	0 - 5V
B3	0 - 5V	0 - 5V
B4	0 - 5V	0 - 5V
B5	0 - 5V	0 - 5V
B6	0 - 1.5V	0 - 1.5V
B7	0 - 1.5V	0 - 1.5V

AMUX PINS ASSIGNED ON CSA PG.38

The PMU AMU channels route to the PMU on-chip ADC. The ADC full-scale range is set by OTP and locked to the value shown in the table on the left.
0 - 1.5V (1x gain)
0 - 5.0V (0.3x gain)
GND (Unused pin)
Note that the AMUX_x# connections to AMUX_xY behaviour is not affected by the range selection and is always a 1:1

Apple Proprietary and Confidential

PAGE TITLE
SYS PWR: PMU: GPIO (4/5) (36)

Apple Inc.

DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

BATTERY CURRENT SENSE FILTER

#: 48608248

R3700 1K 1% 1/32W TK 1005 118500255 ROOM=PMU
C3700 0.22UF 10% 6.3V CER-X5R 1005 132500014 ROOM=PMU NO_XNET_CONNECTION
R3701 1K 1% 1/32W TK 1005 118500255 ROOM=PMU

42 ANALOG_PMU_IBATT_VCC_SENSE_R_N → J11 IBAT
42 ANALOG_PMU_IBATT_VCC_SENSE_R_P → J10 VBAT

R3702 9.53K 1% 1/32W TK 1005 ROOM=PMU CRITICAL 118500246
50 ANALOG_PMU_BATT_VCC_SENSE
#: 48731558

C3701 0.1UF 20% 6.3V X5R-CERM 1005 ROOM=PMU 13250316

INTERNAL 1MOHM PULLDOWN ON ADC_IN

39 GND → E14 BRICK_ID1
ANALOG_PMU_BATT_VCC_SENSE_FILT → E12 BRICK_ID2
AMUX_PMU_TO_ADC_IN 38 → H11 ADC_IN

BATTERY VOLTAGE SENSE FILTER

3 dB down frequency
approx. 360 Hz due to voltage derating of cap C3701
Goal is <0.5 dB down at 100 Hz. for both V and I measurements

37 CLK_PMU_XTAL2_XOUT_32K → D1 XOUT
C3703 1PF +/-0.1PF 16V NP0/C0G 01005 ROOM=PMU CRITICAL 131500342
XW3721 SHORT-01005
35 39 PP1V5_ALWAYS — IO_PMU_XTAL_SEL_1V5 → L11 NXTAL_MEMS
E1 XIN
E2 VSS

U3300 BAKU-STUDY WLCSP SYM 5 OF 6 ROOM=PMU 998-25286
OMIT_TABLE

ADC / NTC
F11 TDEV1 NTC_FOREHEAD_P 49
F12 TDEV2 NTC_RADIO_BB_P 504
F13 TDEV3 NTC_RADIO_PA_P 503
F14 TDEV4 NTC_AP_P 49
G12 TDEV5 NTC_BATTERY_P 49

E15 TCAL ← ANALOG_PMU_TCAL

32KHZ OSCILLATOR / REFERENCES
H10 VREF_ADC ← ANALOG_PMU_VREF_ADC
K11 VREF ← ANALOG_PMU_VREF
J12 VSS_REF ← ANALOG_PMU_VSS_REF

49239106
C3704 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=PMU 138500450
PLACE_NEAR=U3300,J12:1MM
XW3701 SHORT-20L-0.05MM-SM ROOM=PMU PLACE_NEAR=U3300.K12:1MM 998-03569

C3705 0.1UF 20% 6.3V X5R-CERM 1005 ROOM=PMU 13250316
ANALOG_PMU_VSS_VREF_ADC
XW3702 SHORT-20L-0.05MM-SM ROOM=PMU PLACE_NEAR=U3300.K12:1MM 998-03569

TCAL RESISTOR MUST BE 0.1%
R3703 3.92K 0.1% 1/32W TK 01005-1 ROOM=PMU 103500558

MEMS Oscillator (Active)

PP1V8_ALWAYS 37 39
C3709 0.1UF 10% 10V X6S-CERM 0201 ROOM=PMU 132500030
Y3701 32.768KHZ CSP-1 197500437 ROOM=PMU
NC 1 — NC CLKOUT — 2 CLK_PMU_XTAL2_XOUT_32K_R → 37
GND 4
R3720 0 0% 1/32W TK 1005 ROOM=PMU 117500067
CLK_PMU_XTAL2_XOUT_32K_R — CLK_PMU_XTAL2_XOUT_32K → 37

MEMS Oscillator (ALT)

PP1V8_ALWAYS_R — R3705 0 0% 1/32W TK 1005 ROOM=PMU BOMOPTION=NOSTUFF 117500067 — PP1V8_ALWAYS 37 39
C3706 0.1UF 20% 6.3V X5R-CERM 1005 ROOM=PMU BOMOPTION=NOSTUFF 13250316
Y3702 32.768KHZ CSP-1 197500437 BOMOPTION=NOSTUFF ROOM=PMU
NC 1 — NC CLKOUT — 2 CLK_PMU_XTAL2_XOUT_32K_ALT_R1
R3704 0 0% 1/32W TK 1005 ROOM=PMU BOMOPTION=NOSTUFF 117500067
CLK_PMU_XTAL2_XOUT_32K_R → 37

PP_VDD_MAIN

VDD_MAIN_SNS: Drop single via to VDD_MAIN plane, place XW3703 directly at the via to the plane

39 PP_VDD_MAIN — 5mA (MAX)
XW3703 SHORT-20L-0.05MM-SM ROOM=PMU 998-03569 NO_XNET_CONNECTION
ANALOG_PMU_VDD_MAIN_SNS → K10 VDD_MAIN_SNS

39 PP1V5_ALWAYS — 60mA (MAX)

U3300 BAKU-STUDY WLCSP SYM 6 OF 6 ROOM=PMU 998-25286
OMIT_TABLE

VDD_MAIN: E4, E16, K9, U3, U16
VDD_ANA: C3, C7, C11, C15, C17, G17, H7, L9, L17, N5, R17, U10, V3, V7, V13, V17
VDD_DIG: D16, E5, J8, M14, R14, T5

VSS: A16, B10, B16, B17, C1, C5, C8, C9, C10, C13, C16, D3, D5, D7, D11, D13, D15, D17, E6, E17, F7, F15, F16, F17, F18, G14, G15, H8, H13, H17, J16, J17, K12, K16, K17, L16, M6, M17, N6, N17, P6, P16, P17, P18, R6, R16, T1, T3, T4, U1, U5, U17, V1, V5, V8, V9, V10, V11, V12, V15, V16, V18, W14

PAGE TITLE	SYS PWR: PMU: Misc (5/5) (37)
	Apple Inc.
DRAWING NUMBER	D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

PMU GPIOs

PMU_GPIO1	36	GPIO_PMU_TO_NAND_LOW_BATT_BOOT_L	GPIO_PMU_TO_NAND_LOW_BATT_BOOT_L	31 128	
PMU_GPIO2	36	GPIO_S4_PMU_TO_SPKRAMP_BOT_RESET_L	GPIO_S4_PMU_TO_SPKRAMP_BOT_RESET_L	128 505	
PMU_GPIO3	36	CLK_GPIO_S2_PMU_TO_ALS_32K_1V8	CLK_GPIO_S2_PMU_TO_ALS_32K_1V8	111	
PMU_GPIO4	36	IO_BUTTON_SIDE_L_1V8	IO_BUTTON_SIDE_L_1V8	39 128 145	
PMU_GPIO5	36	GPIO_S4_PMU_NFC_TO_ARCAMP_TRIG_1V8	GPIO_S4_PMU_NFC_TO_ARCAMP_TRIG_1V8	82 505	
PMU_GPIO6	36	GPIO_PMU_FROM_BB_PCIE_HOST_WAKE_L	GPIO_PMU_FROM_BB_PCIE_HOST_WAKE_L	503	
PMU_GPIO7	36	NC_PMU_GPIO7	NC_PMU_GPIO7	NO_TEST=TRUE	
PMU_GPIO8	36	GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON	GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON	503	
PMU_GPIO9	36	GPIO_SEQ_PMU_TO_WLCHGR_EN_SYS	GPIO_SEQ_PMU_TO_WLCHGR_EN_SYS	144	
PMU_GPIO10	36	GPIO_PMU_SMC_FIXTURE_MODE_L	GPIO_PMU_SMC_FIXTURE_MODE_L	126	
PMU_GPIO11	36	GPIO_PMU_FROM_CHARGER_VBUS_DET_INT_L_1V8	GPIO_PMU_FROM_CHARGER_VBUS_DET_INT_L_1V8	40 128	
PMU_GPIO12	36	IO_BUTTON_RINGER_L	IO_BUTTON_RINGER_L	26 503	
PMU_GPIO13	36	GPIO_S4_PMU_NFC_TO_ARCAMP_RESET_L_1V8	GPIO_S4_PMU_NFC_TO_ARCAMP_RESET_L_1V8	82 505	
PMU_GPIO14	36	GPIO_SEQ_PMU_TO_BBPMU_RESET_L	GPIO_SEQ_PMU_TO_BBPMU_RESET_L	503	
PMU_GPIO15	36	GPIO_SEQ_PMU_TO_BOOST_BYPASS_L_1V8	GPIO_SEQ_PMU_TO_BOOST_BYPASS_L_1V8	43 128	
PMU_GPIO16	36	GPIO_PMU_FROM_WLAN_HOST_WAKE	GPIO_PMU_FROM_WLAN_HOST_WAKE	503	
PMU_GPIO17	36	I2C2_AOP_SCL	I2C2_AOP_SCL	16 25 506	
PMU_GPIO18	36	GPIO_SEQ_PMU_TO_BOOST_EN_1V8	GPIO_SEQ_PMU_TO_BOOST_EN_1V8	42 43	
PMU_GPIO19	36	GPIO_SEQ_PMU_TO_DISPLAY_RESET_L_1V8	GPIO_SEQ_PMU_TO_DISPLAY_RESET_L_1V8	93 118	
PMU_GPIO20	36	CLK_GPIO_S4_PMU_TO_WLAN_32K	CLK_GPIO_S4_PMU_TO_WLAN_32K	38 503	
PMU_GPIO21	36	GPIO_SEQ_PMU_TO_NFC_RST_L	GPIO_SEQ_PMU_TO_NFC_RST_L	142	
PMU_GPIO22	36	GPIO_SEQ_PMU_TO_SLP_CACHE_SW_EN_S1P5	GPIO_SEQ_PMU_TO_SLP_CACHE_SW_EN_S1P5	45 128	
PMU_GPIO23	36	NC_PMU_GPIO23	NC_PMU_GPIO23	NO_TEST=TRUE	
PMU_GPIO24	36	IO_AOP_SEQ_PMU_DPMIC_TO_DISPLAY_PANICB_L_1V8	IO_AOP_SEQ_PMU_DPMIC_TO_DISPLAY_PANICB_L_1V8	93 102 118	
PMU_GPIO25	36	CLK_GPIO_S2_APPMU_TO_BBPMU_32K_1V8	CLK_GPIO_S2_APPMU_TO_BBPMU_32K_1V8	504	

R3800
200K
1%
1/32W
TK
01005-1
ROOM=ARC
PACK_OPTION=MLB
118500057

R3801
200K
1%
1/32W
TK
01005-1
ROOM=ARC
PACK_OPTION=MLB
118500057

56925452 Tie I2C2_AOP_SCL_SEQ to PMU GPIO17 to mitigate Allston/LPEM issue

PMU_AMUX_A0	36	AMUX_SOC_TO_PMU_AMUX_OUT_POS	AMUX_SOC_TO_PMU_AMUX_OUT_POS	10 128
PMU_AMUX_A1	36	GPIO_AP_TO_AMUX_PMU_SYNC	GPIO_AP_TO_AMUX_PMU_SYNC	26
PMU_AMUX_A2	36	AMUX_PMU_TO_ADC_IN	AMUX_PMU_TO_ADC_IN	37
PMU_AMUX_A3	36	ANALOG_PP_SRAM_S1P5_SENSE	ANALOG_PP_SRAM_S1P5_SENSE	45
PMU_AMUX_A4	36	AMUX_RCAM_PVDD	AMUX_RCAM_PVDD	62
PMU_AMUX_A5	36	IO_DISPLAY_TO_DPMIC_AVDDH_EN_1V8	IO_DISPLAY_TO_DPMIC_AVDDH_EN_1V8	93 118
PMU_AMUX_A6	36	GND	GND	38 39 503 504 505 506 507
PMU_AMUX_A7	36	GND	GND	38 39 503 504 505 506 507
PMU_AMUX_B0	36	AMUX_SOC_TO_PMU_AMUX_OUT_NEG	AMUX_SOC_TO_PMU_AMUX_OUT_NEG	10 128
PMU_AMUX_B1	36	AMUX_PMU_FROM_DISPLAY	AMUX_PMU_FROM_DISPLAY	93
PMU_AMUX_B2	36	AMUX_DIV_STROBE_BOOST_OUT	AMUX_DIV_STROBE_BOOST_OUT	65
PMU_AMUX_B3	36	AMUX_PMU_FROM_ALEX_CAM_PMU	AMUX_PMU_FROM_ALEX_CAM_PMU	54 62
PMU_AMUX_B4	36	GPIO_CAM_PMU1_FROM_REGULUS_INT_1V8	GPIO_CAM_PMU1_FROM_REGULUS_INT_1V8	55 70 128
PMU_AMUX_B5	36	GND	GND	38 39 503 504 505 506 507
PMU_AMUX_B6	36	CLK_AP_TO_PMU_TST_CLKOUT	CLK_AP_TO_PMU_TST_CLKOUT	10 129
PMU_AMUX_B7	36	CLK_GPIO_S4_PMU_TO_WLAN_32K	CLK_GPIO_S4_PMU_TO_WLAN_32K	38 503

Apple Proprietary and Confidential

PAGE TITLE
SYS PWR: PMU: Aliases: GPIO (38)

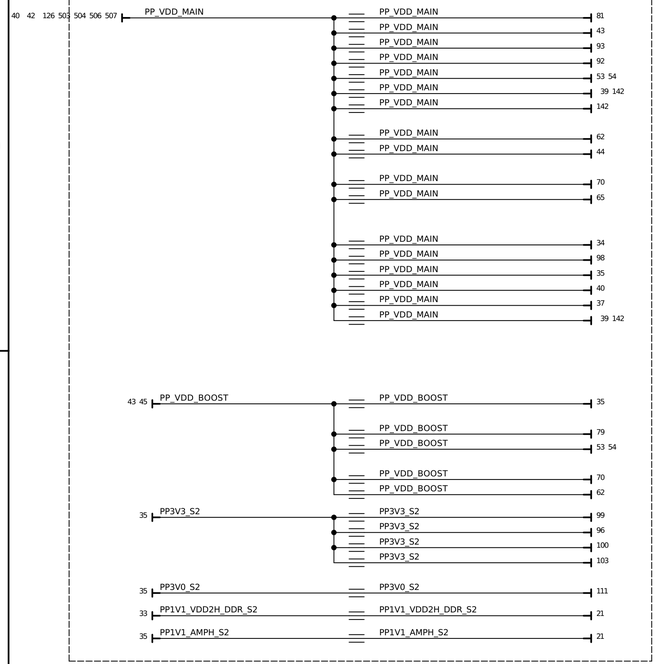
Apple Inc.

DRAWING NUMBER

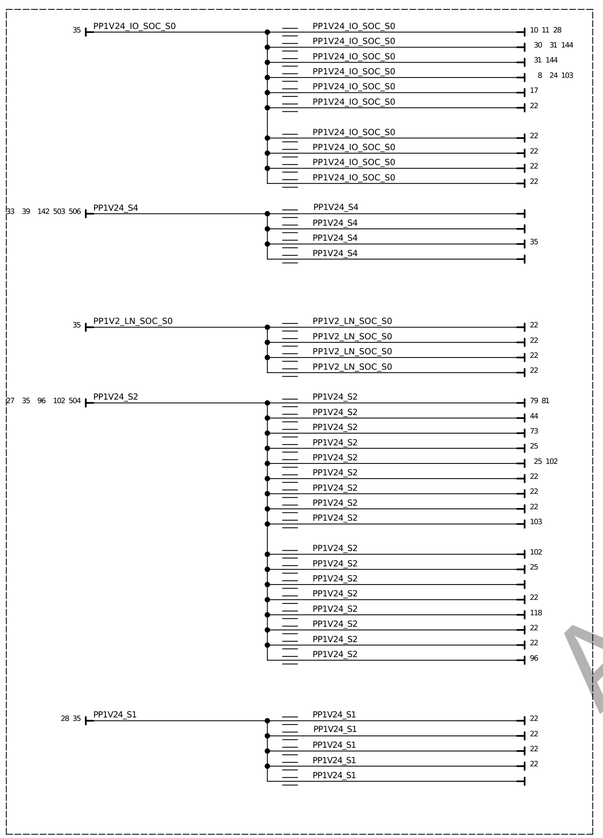
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

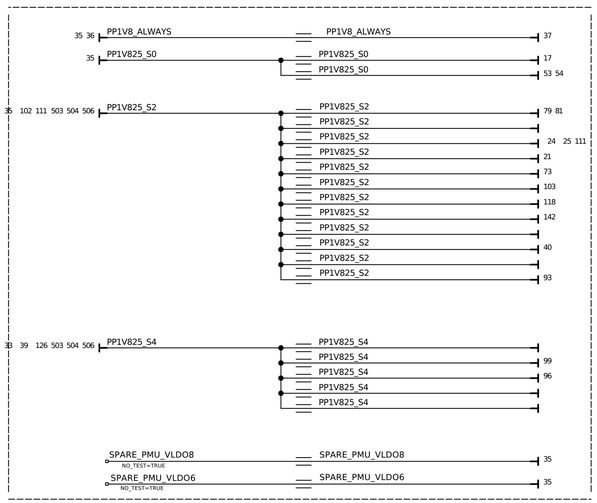
PP Misc Domains



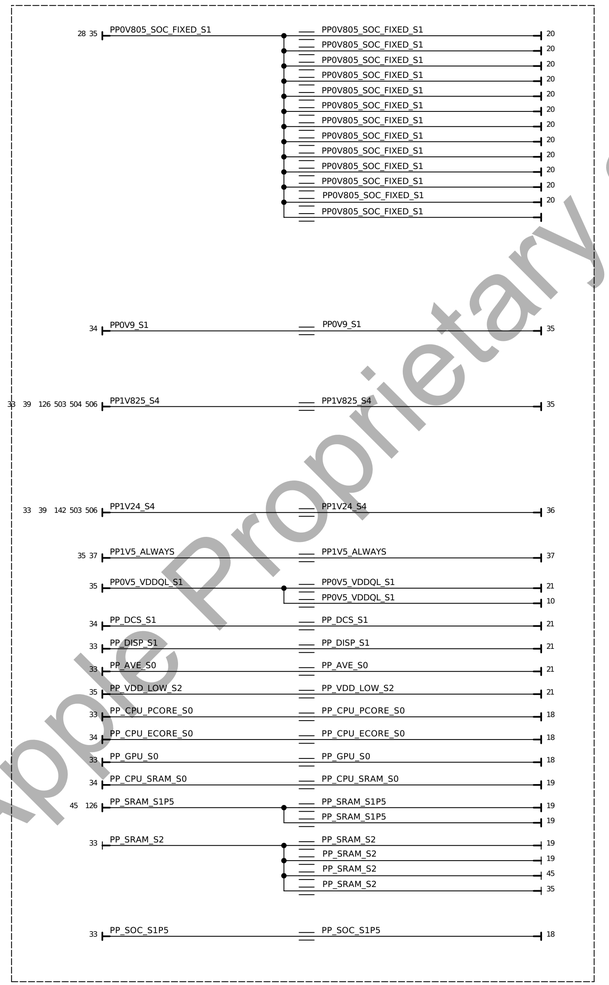
PP1V2 Domains



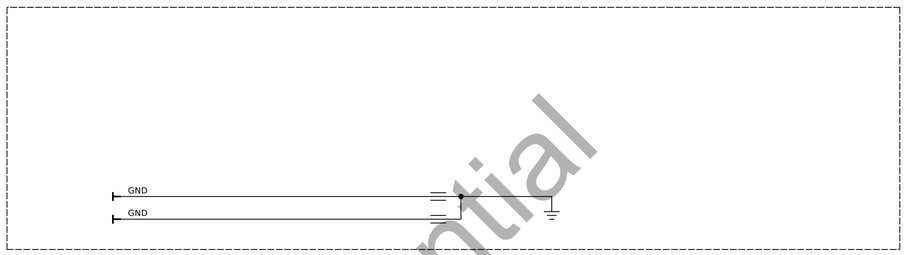
PP1V8 Domains



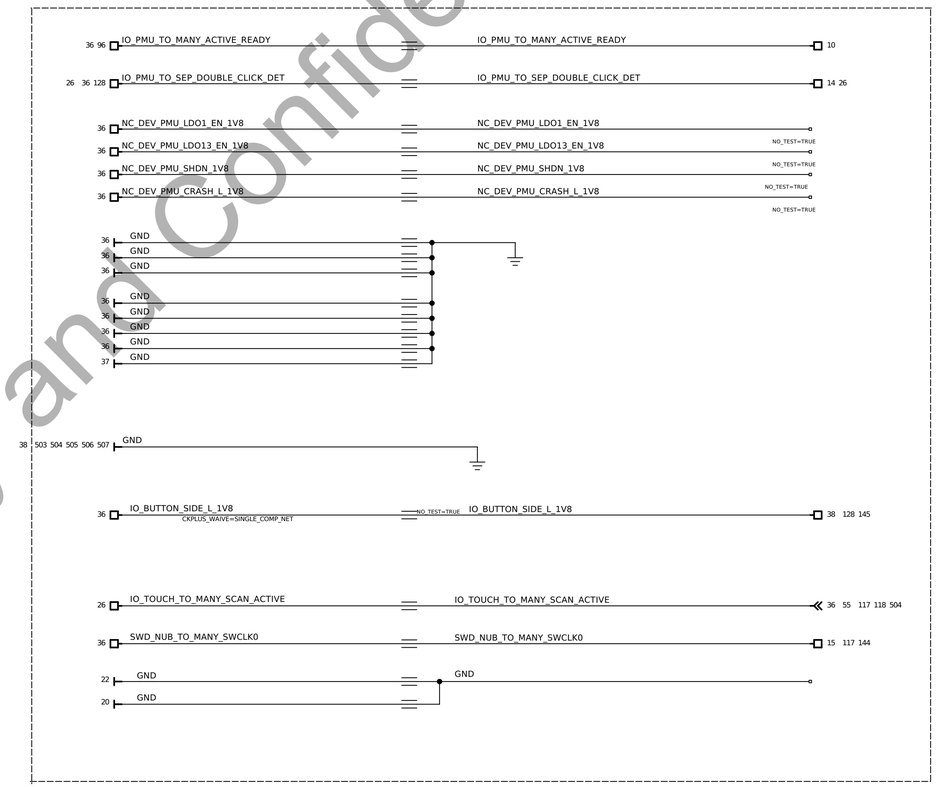
SOC + PMU Power Assignments



DEV Board Compatability



PMU Dedicated IO Assignments



Apple Proprietary and Confidential

PAGE TITLE
SYS PWR: PMU: Aliases: Misc. (39)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

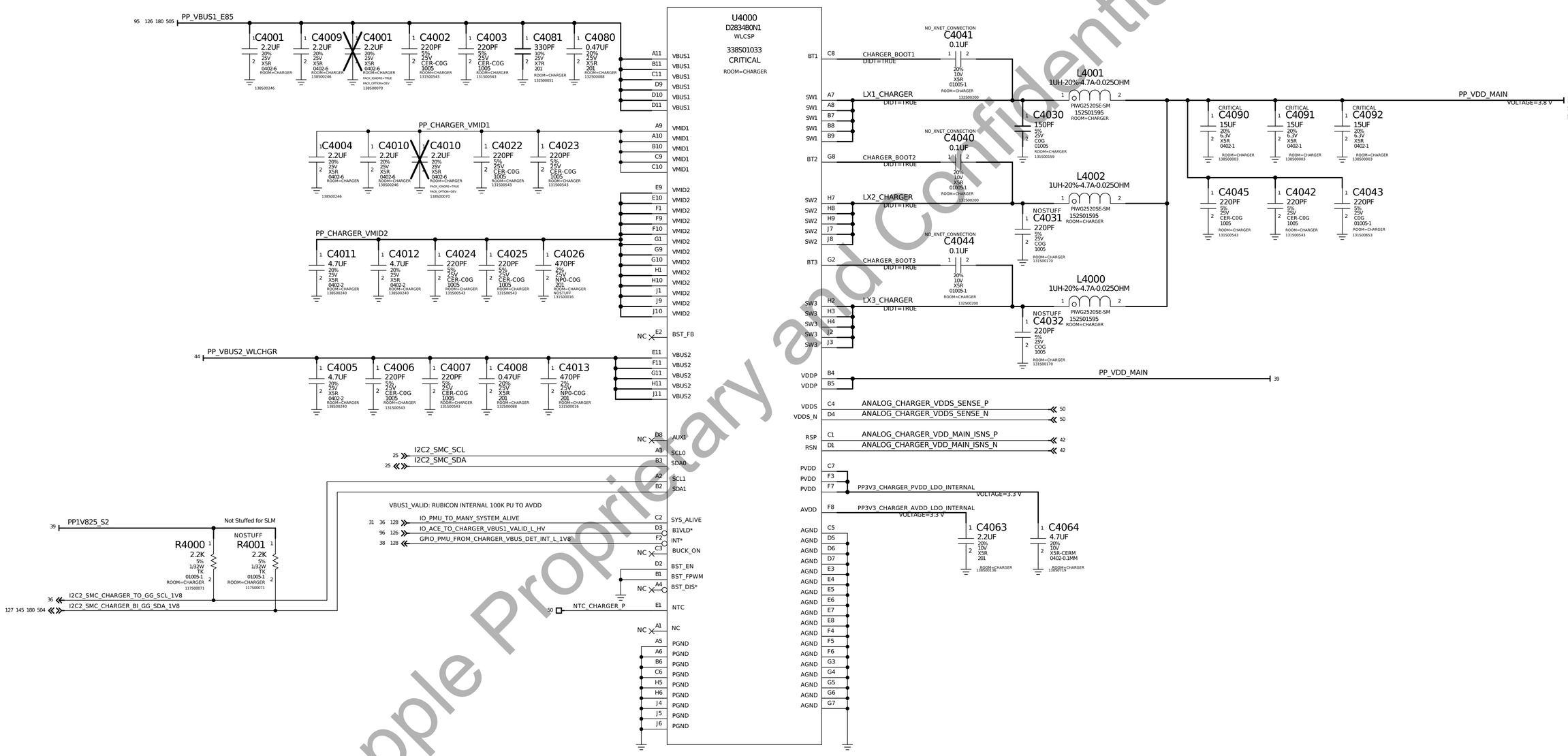
CHARGER

SUBSYSTEM SPECIFIC BOM TABLES

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
152S01596	152S01595	L4000-L4002	TAIYO,1UH,20%,4.7A,33MO,H=0.95,2520

INPUTS

OUTPUTS



Apple Proprietary and Confidential

PAGE TITLE

SYS PWR: Charger (40)

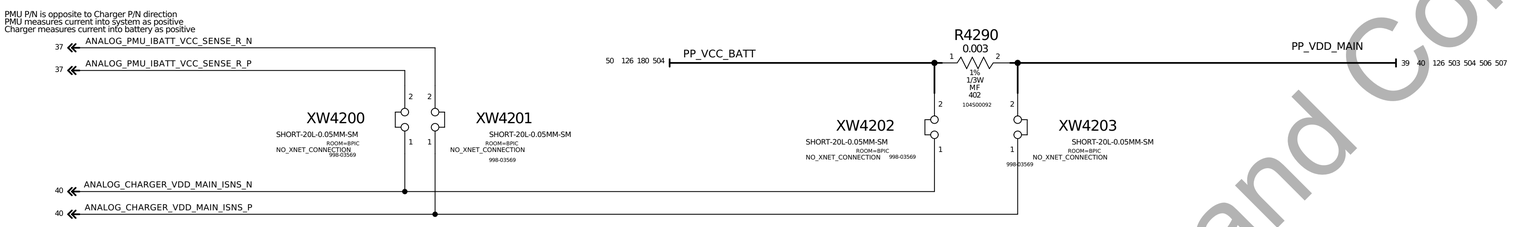
Apple Inc.

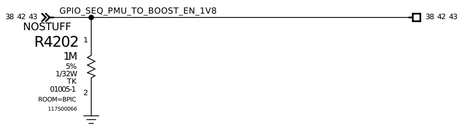
DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

VDD_MAIN Sense Resistor





Apple Proprietary and Confidential

PAGE TITLE
SYS PWR: VDD_MAIN Sense Resistor (42)

Apple Inc.

DRAWING NUMBER D

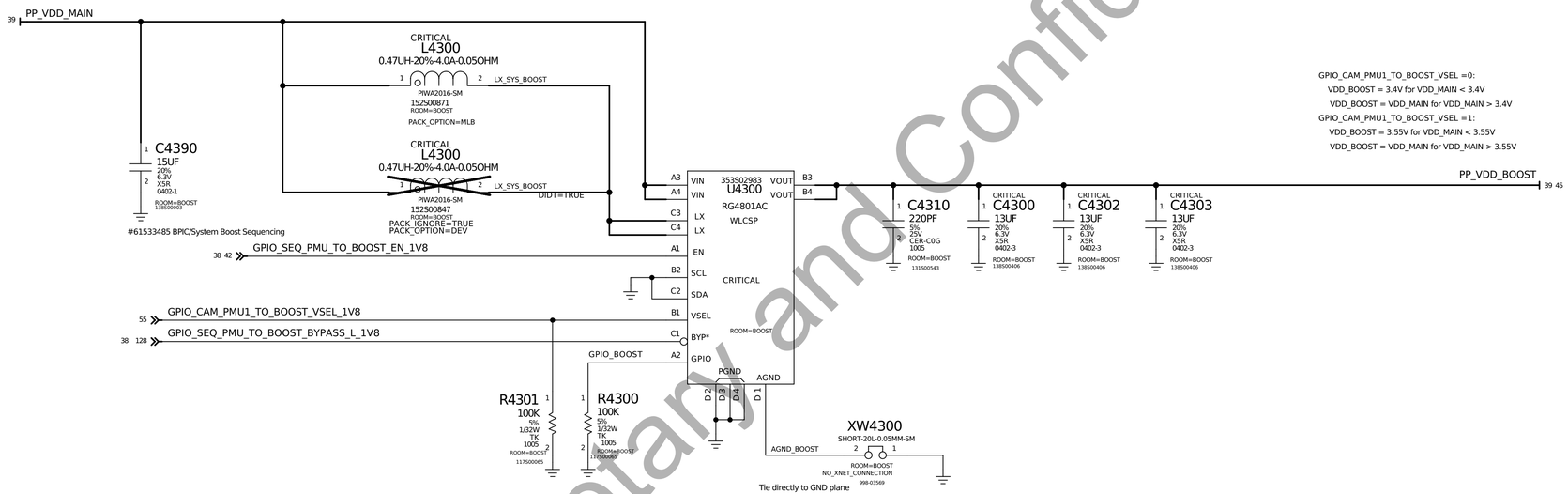
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

BOOST

SUBSYSTEM SPECIFIC BOM TABLES

Boost

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
353S03002	353S02983	U4300	IC,SN61280H,BOOST,3.4/3.55V,4.5A,CSP16,TI



Apple Proprietary and Confidential

PAGE TITLE
SYS PWR: Boost (43)

Apple Inc.

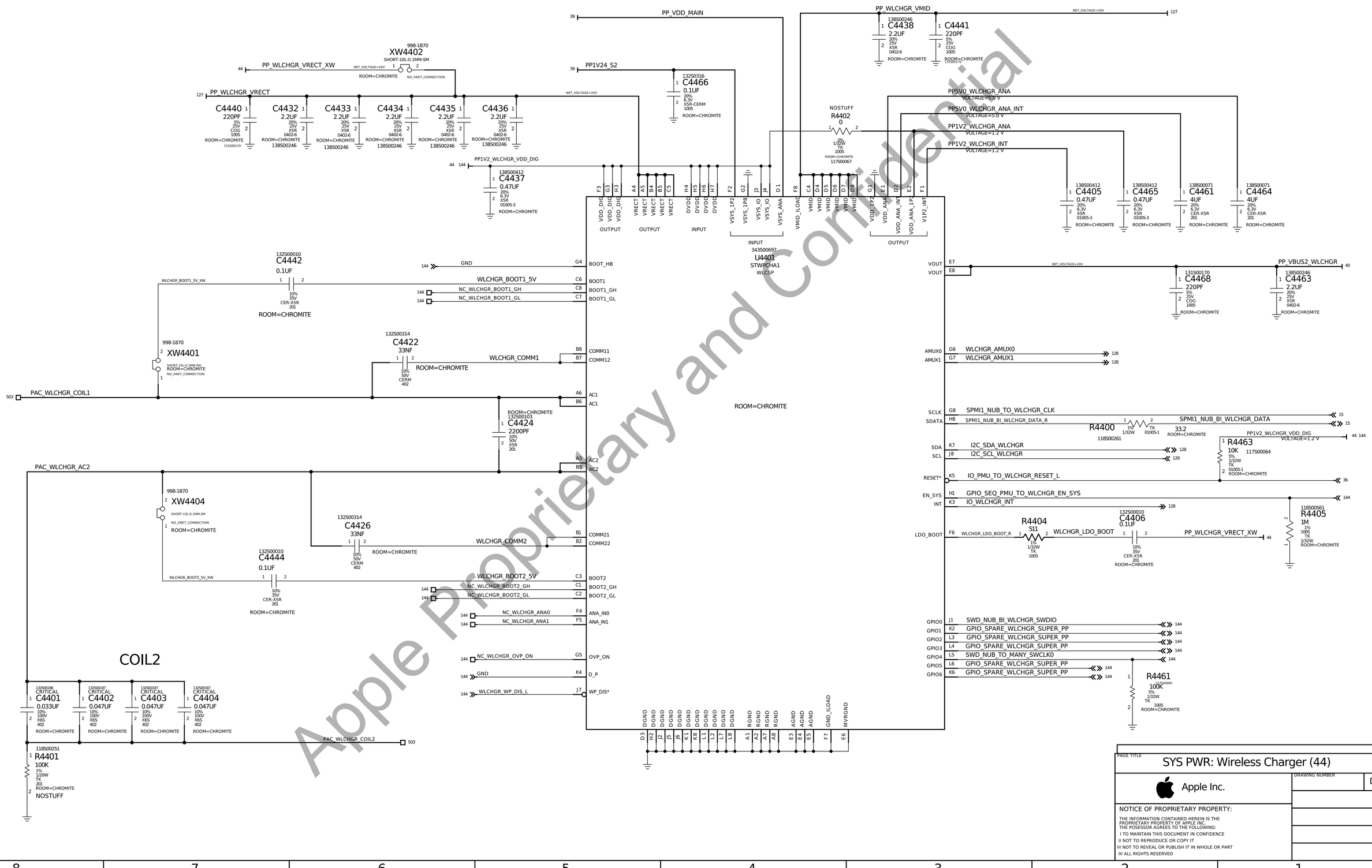
DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Wireless Charger



Apple Proprietary and Confidential

PAGE TITLE: SYS PWR: Wireless Charger (44)

Apple Inc.

DRAWING NUMBER: D

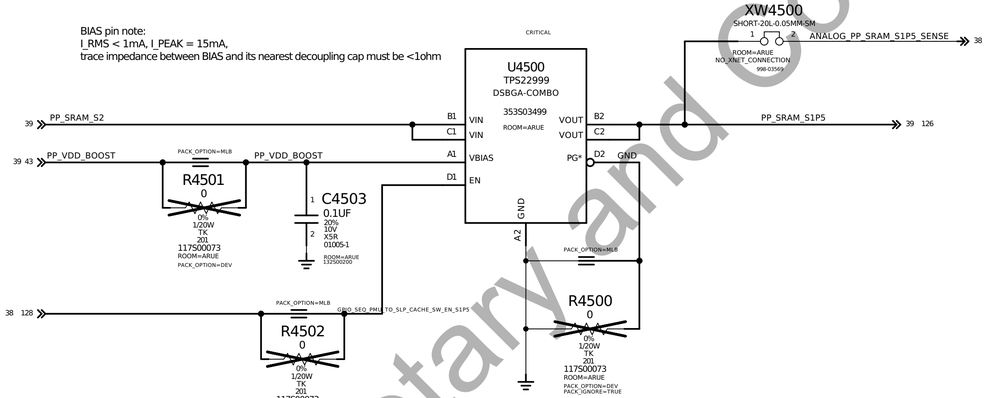
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SUBSYSTEM SPECIFIC BOM TABLES

Power Sys



Apple Proprietary and Confidential

PAGE TITLE

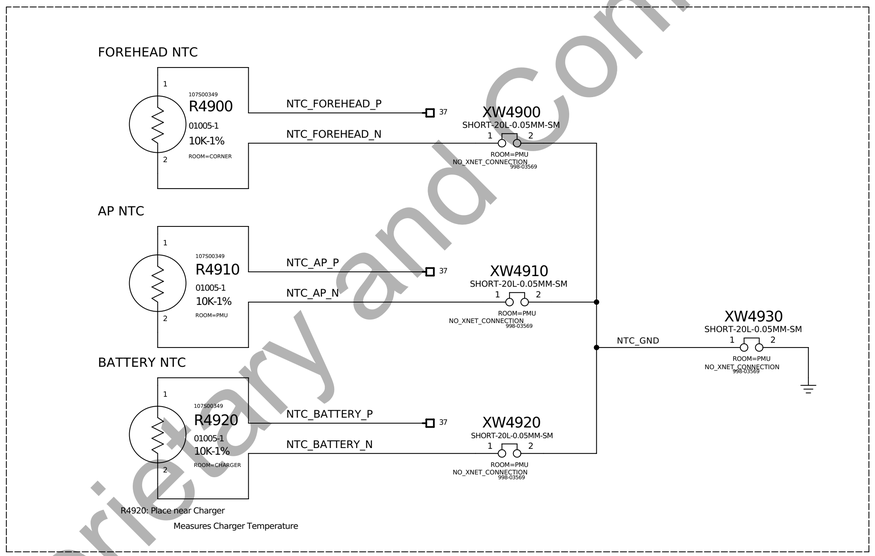
SYS PWR:

Apple Inc.

DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED



Apple Proprietary and Confidential

PAGE TITLE

SYS PWR: NTCs (Top) (49)

Apple Inc.

DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

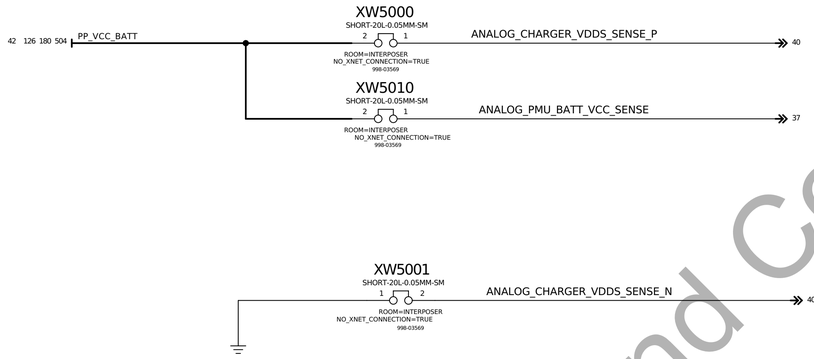
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

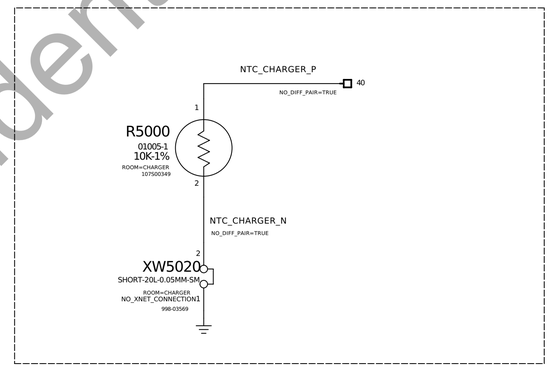
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

Batt sense lines. Place near PP_VCC_BATT Interposer pins



Rubicon NTC



Apple Proprietary and Confidential

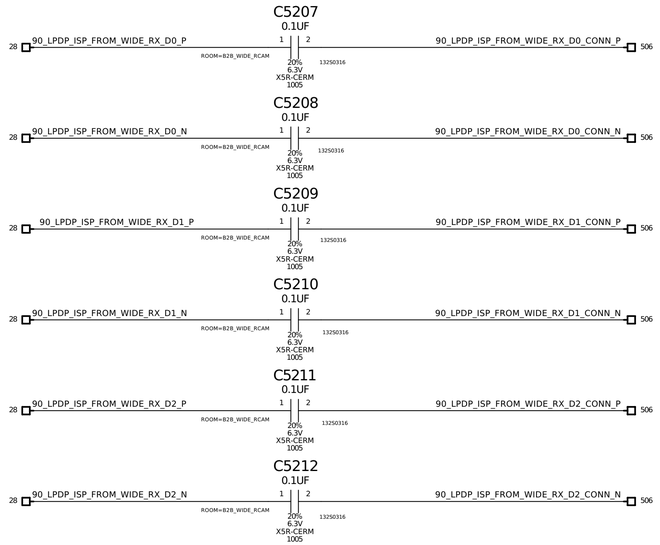
PAGE TITLE
SYS PWR: Charger Sense (50)

Apple Inc.

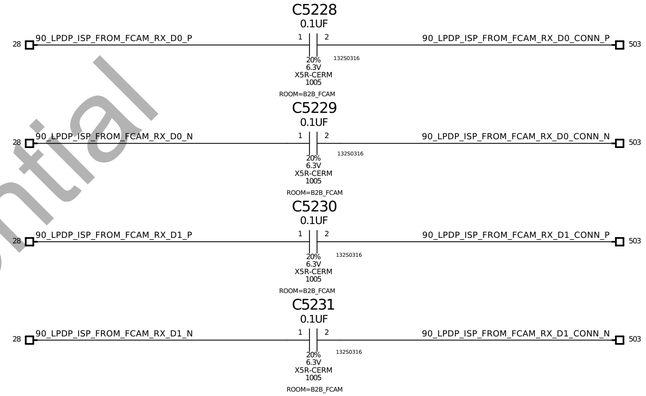
DRAWING NUMBER
D

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

WIDE LPDP FILTERS



FCAM LPDP FILTERS



Apple Proprietary and Confidential

PAGE TITLE
CAMERA: LPDP AC FILTERS (52)

Apple Inc.

DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:

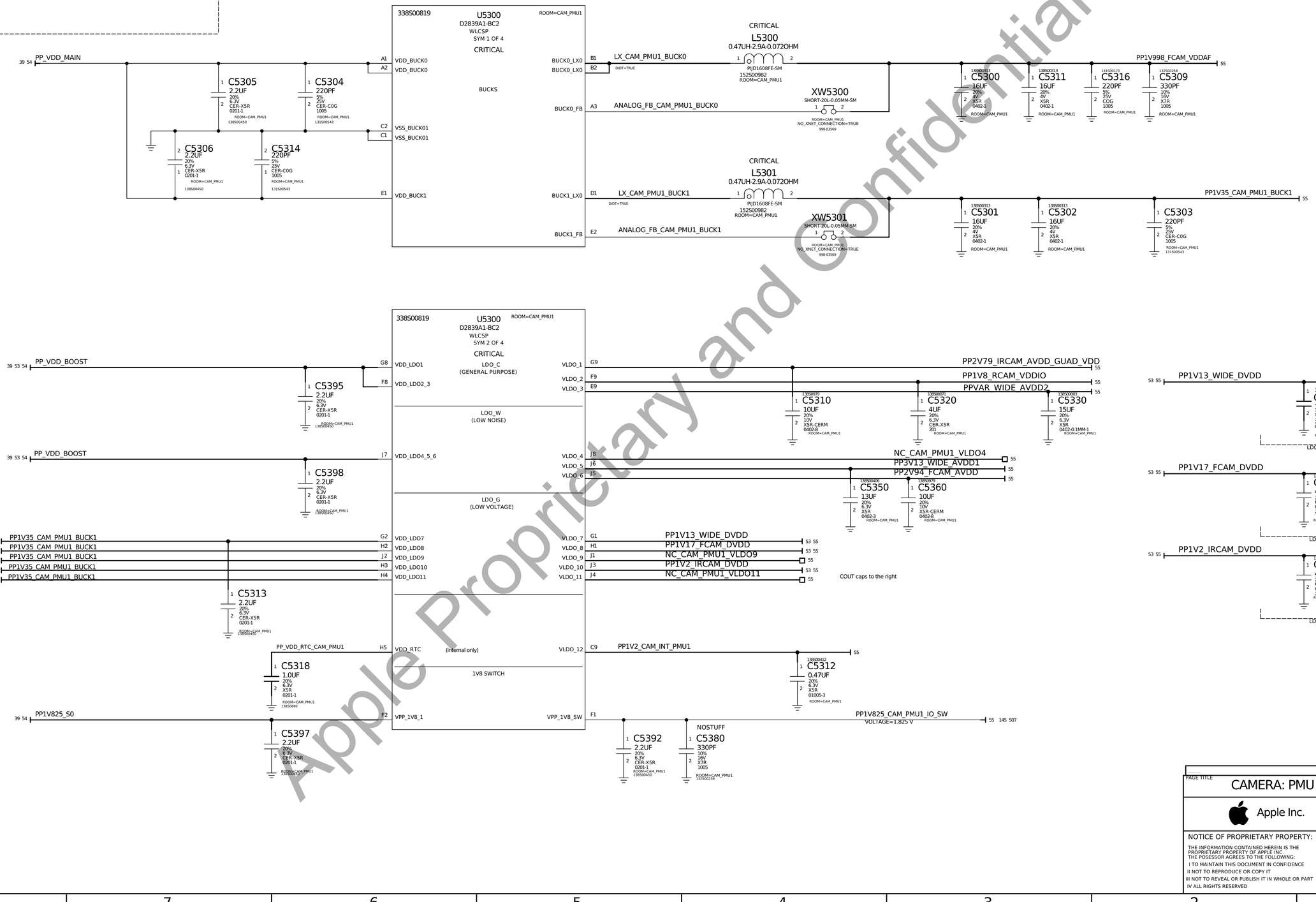
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

CAMERA PMU1

SUBSYSTEM SPECIFIC BOM TABLES

4uF 0201 Capacitors (single-source Murata)

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00116	138S00071	(C5315,C5386)	0201,4uF,X5R,6.3V,Taiyo
138S00117	138S00071	(C5315,C5386)	0201,4uF,X5R,6.3V,Kyocera
138S00515	138S00071	(C5315,C5386)	CAP,X5R,4UF,0201,0.55MM,SEMCO



Apple Proprietary and Confidential

PAGE TITLE
CAMERA: PMU 1: Power (1/2) (53)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

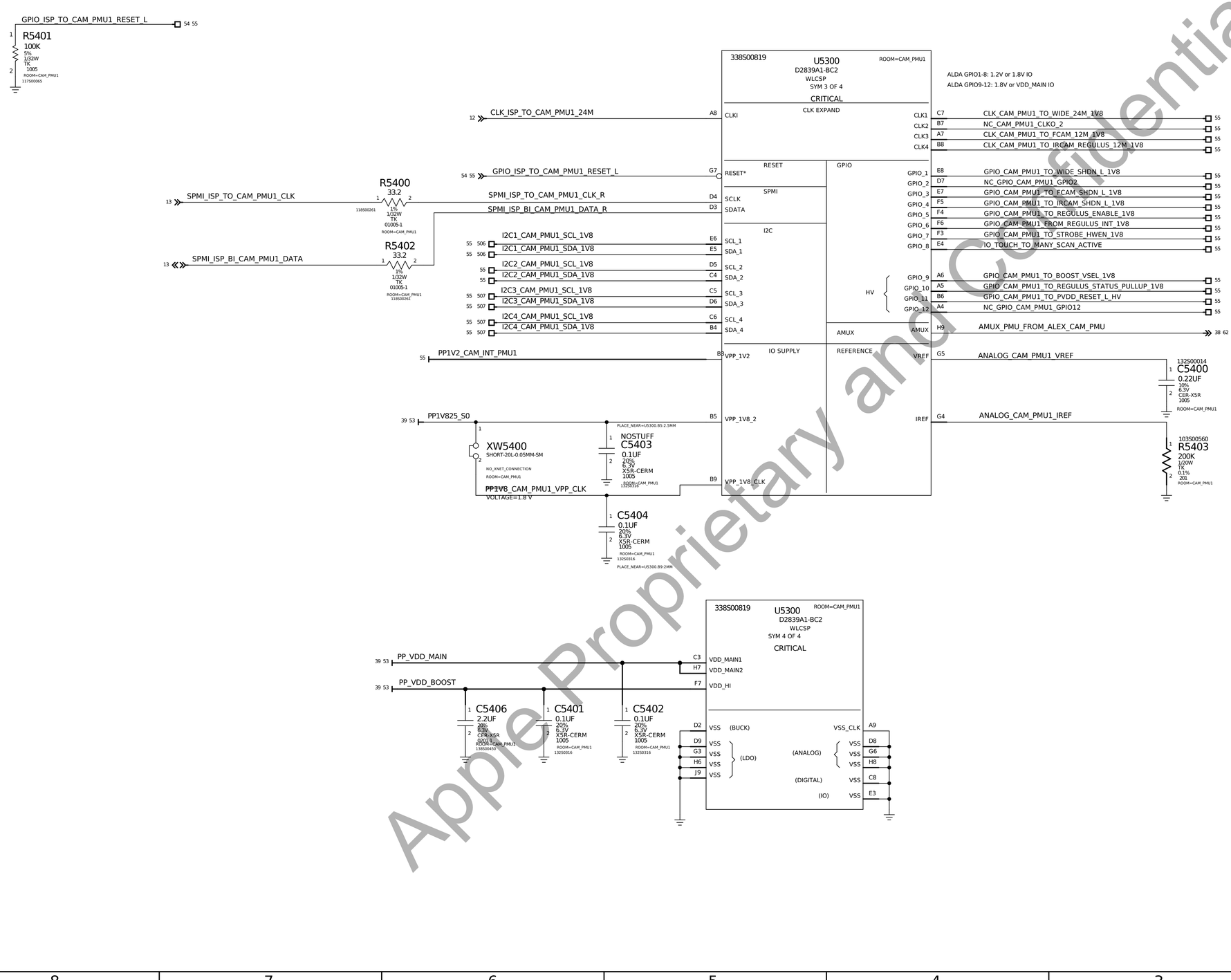
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

CAMERA PMU1



Apple Proprietary and Confidential

PAGE TITLE

CAMERA: PMU 1: I/O (2/2) (54)

Apple Inc.

DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

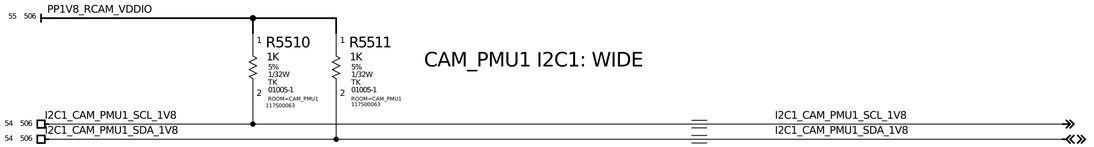
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

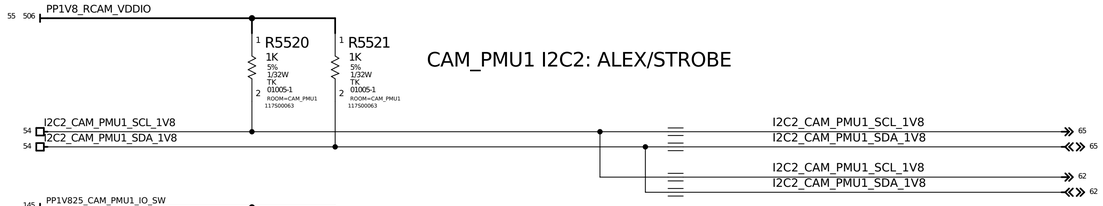
II NOT TO REPRODUCE OR COPY IT

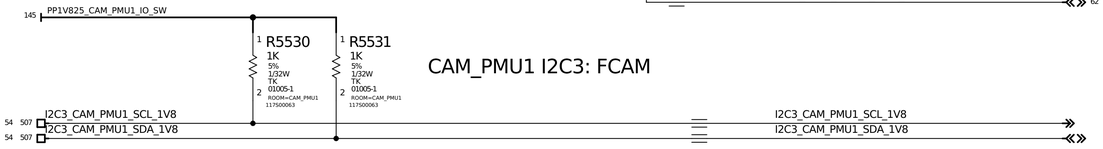
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

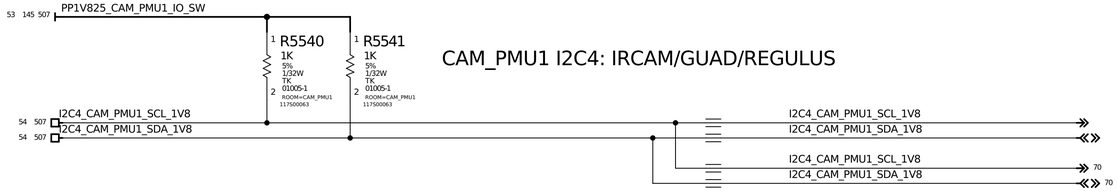
IV ALL RIGHTS RESERVED

CAMERA PMU1








53 145 507 PP1V825_CAM_PMU1_IO_SW
R5540 1K 5% 1/32W TK 01005-1 ROOM=CAM_PMU1 117500063
R5541 1K 5% 1/32W TK 01005-1 ROOM=CAM_PMU1 117500063
CAM_PMU1 I2C4: IRCAM/GUAD/REGULUS
54 507 I2C4_CAM_PMU1_SCL_1V8
54 507 I2C4_CAM_PMU1_SDA_1V8
I2C4_CAM_PMU1_SCL_1V8 70
I2C4_CAM_PMU1_SDA_1V8 70

DOMAIN	CAM PMU1	NUMBER	I2C1	DIAGS NUMBER	4	SPEED	1MHz
DEVICE	VOLTAGE		7-BIT ADDR	8-BIT ADDR	MAX SPEED		LOCATION
Wide	1.8V		0x10	0x20,0x21	1MHz		RCAM MW FLEX
Lorentz	1.8V		0x74	0xE8,0xE9	1MHz		RCAM MW FLEX

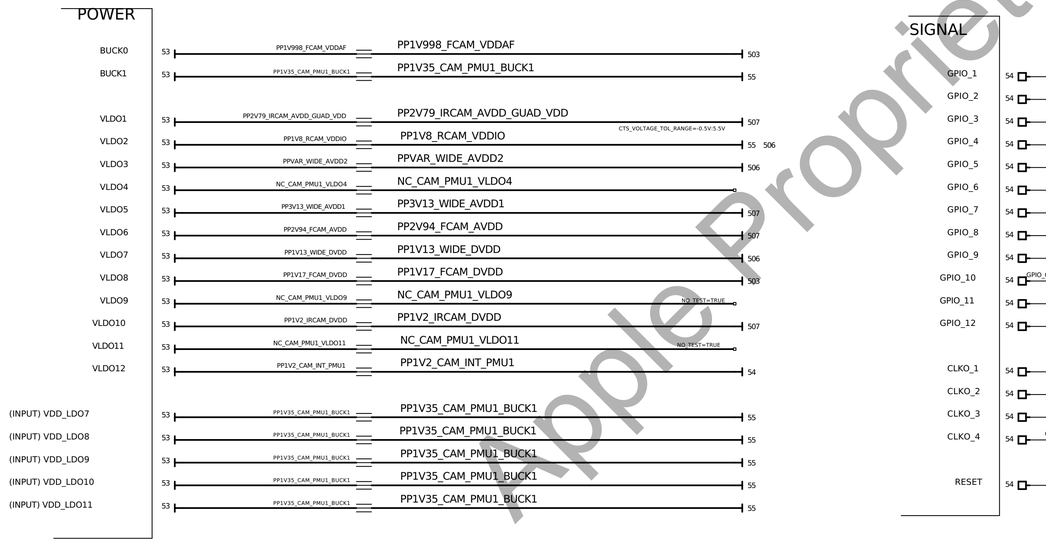
Lorentz can use addresses 0x74,0x75,0x76,0x77 for different modes

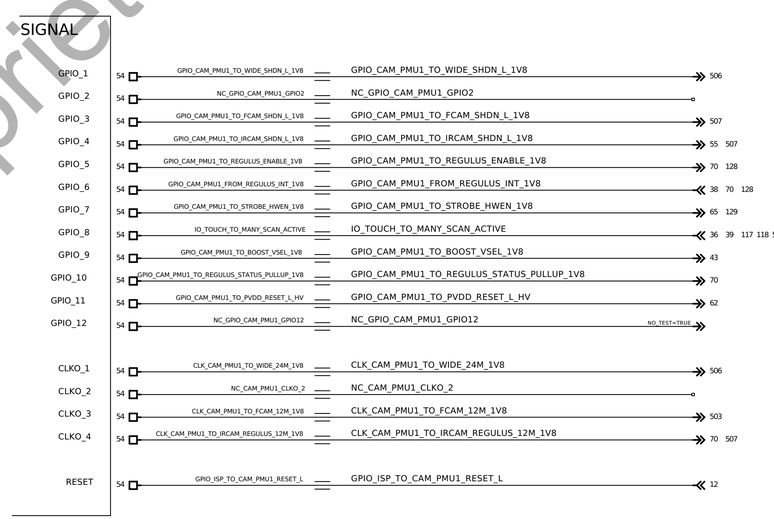
DOMAIN	CAM PMU1	NUMBER	I2C2	DIAGS NUMBER	5	SPEED	1MHz
DEVICE	VOLTAGE		7-BIT ADDR	8-BIT ADDR	MAX SPEED		LOCATION
Yeti	1.8V		0x65	0xCA,0xCB	1MHz		CG MLB
Alex	1.8V		0x76	0xEC,0xED	1MHz		CG MLB

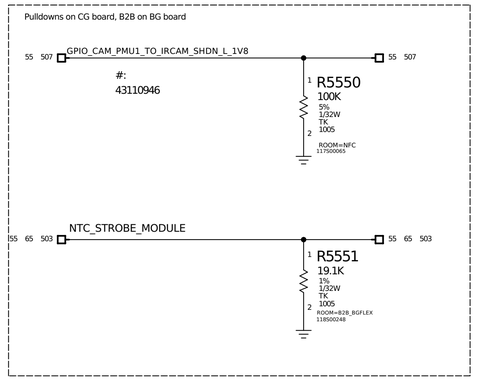
DOMAIN	CAM PMU1	NUMBER	I2C3	DIAGS NUMBER	6	SPEED	1MHz
DEVICE	VOLTAGE		7-BIT ADDR	8-BIT ADDR	MAX SPEED		LOCATION
FCAM	1.8V		0x10	0x20,0x21	1MHz		FCAM SC FLEX
Faraday	1.8V		0x59	0xB2,0xB3	1MHz		FCAM SC FLEX

DOMAIN	CAM PMU1	NUMBER	I2C4	DIAGS NUMBER	7	SPEED	1MHz
DEVICE	VOLTAGE		7-BIT ADDR	8-BIT ADDR	MAX SPEED		LOCATION
IRCAM	1.8V		0x18	0x30,0x31	1MHz		Banff Flex
Guadalupe	1.8V		0x64	0xC8,0xC9	1MHz		Banff Flex
Regulus	1.8V		0x71	0xE2,0xE3	1MHz		CG MLB

Guadalupe 7 bit addr alternatives are 0x45,0x69,0x35


POWER
BUCK0 53 PP1V998_FCAM_VDDAF PP1V998_FCAM_VDDAF 503
BUCK1 53 PP1V35_CAM_PMU1_BUCK1 PP1V35_CAM_PMU1_BUCK1 55
VLDO1 53 PP2V79_IRCAM_AVDD_GUAD_VDD PP2V79_IRCAM_AVDD_GUAD_VDD 507
CTS_VOLTAGE_TOL_RANGE=-0.5V:5.5V
VLDO2 53 PP1V8_RCAM_VDDIO PP1V8_RCAM_VDDIO 55 506
VLDO3 53 PPVAR_WIDE_AVDD2 PPVAR_WIDE_AVDD2 506
VLDO4 53 NC_CAM_PMU1_VLDO4 NC_CAM_PMU1_VLDO4
VLDO5 53 PP3V13_WIDE_AVDD1 PP3V13_WIDE_AVDD1 507
VLDO6 53 PP2V94_FCAM_AVDD PP2V94_FCAM_AVDD 507
VLDO7 53 PP1V13_WIDE_DVDD PP1V13_WIDE_DVDD 506
VLDO8 53 PP1V17_FCAM_DVDD PP1V17_FCAM_DVDD 503
VLDO9 53 NC_CAM_PMU1_VLDO9 NC_CAM_PMU1_VLDO9
NO_TEST=TRUE
VLDO10 53 PP1V2_IRCAM_DVDD PP1V2_IRCAM_DVDD 507
VLDO11 53 NC_CAM_PMU1_VLDO11 NC_CAM_PMU1_VLDO11
NO_TEST=TRUE
VLDO12 53 PP1V2_CAM_INT_PMU1 PP1V2_CAM_INT_PMU1 54
(INPUT) VDD_LDO7 53 PP1V35_CAM_PMU1_BUCK1 PP1V35_CAM_PMU1_BUCK1 55
(INPUT) VDD_LDO8 53 PP1V35_CAM_PMU1_BUCK1 PP1V35_CAM_PMU1_BUCK1 55
(INPUT) VDD_LDO9 53 PP1V35_CAM_PMU1_BUCK1 PP1V35_CAM_PMU1_BUCK1 55
(INPUT) VDD_LDO10 53 PP1V35_CAM_PMU1_BUCK1 PP1V35_CAM_PMU1_BUCK1 55
(INPUT) VDD_LDO11 53 PP1V35_CAM_PMU1_BUCK1 PP1V35_CAM_PMU1_BUCK1 55


SIGNAL
GPIO_1 54 GPIO_CAM_PMU1_TO_WIDE_SHDN_L_1V8 GPIO_CAM_PMU1_TO_WIDE_SHDN_L_1V8 506
GPIO_2 54 NC_GPIO_CAM_PMU1_GPIO2 NC_GPIO_CAM_PMU1_GPIO2
GPIO_3 54 GPIO_CAM_PMU1_TO_FCAM_SHDN_L_1V8 GPIO_CAM_PMU1_TO_FCAM_SHDN_L_1V8 507
GPIO_4 54 GPIO_CAM_PMU1_TO_IRCAM_SHDN_L_1V8 GPIO_CAM_PMU1_TO_IRCAM_SHDN_L_1V8 55 507
GPIO_5 54 GPIO_CAM_PMU1_TO_REGULUS_ENABLE_1V8 GPIO_CAM_PMU1_TO_REGULUS_ENABLE_1V8 70 128
GPIO_6 54 GPIO_CAM_PMU1_FROM_REGULUS_INT_1V8 GPIO_CAM_PMU1_FROM_REGULUS_INT_1V8 38 70 128
GPIO_7 54 GPIO_CAM_PMU1_TO_STROBE_HWEN_1V8 GPIO_CAM_PMU1_TO_STROBE_HWEN_1V8 65 129
GPIO_8 54 IO_TOUCH_TO_MANY_SCAN_ACTIVE IO_TOUCH_TO_MANY_SCAN_ACTIVE 36 39 117 118 504
GPIO_9 54 GPIO_CAM_PMU1_TO_BOOST_VSEL_1V8 GPIO_CAM_PMU1_TO_BOOST_VSEL_1V8 43
GPIO_10 54 GPIO_CAM_PMU1_TO_REGULUS_STATUS_PULLUP_1V8 GPIO_CAM_PMU1_TO_REGULUS_STATUS_PULLUP_1V8 70
GPIO_11 54 GPIO_CAM_PMU1_TO_PVDD_RESET_L_HV GPIO_CAM_PMU1_TO_PVDD_RESET_L_HV 62
GPIO_12 54 NC_GPIO_CAM_PMU1_GPIO12 NC_GPIO_CAM_PMU1_GPIO12
NO_TEST=TRUE
CLKO_1 54 CLK_CAM_PMU1_TO_WIDE_24M_1V8 CLK_CAM_PMU1_TO_WIDE_24M_1V8 506
CLKO_2 54 NC_CAM_PMU1_CLKO_2 NC_CAM_PMU1_CLKO_2
CLKO_3 54 CLK_CAM_PMU1_TO_FCAM_12M_1V8 CLK_CAM_PMU1_TO_FCAM_12M_1V8 503
CLKO_4 54 CLK_CAM_PMU1_TO_IRCAM_REGULUS_12M_1V8 CLK_CAM_PMU1_TO_IRCAM_REGULUS_12M_1V8 70 507
RESET 54 GPIO_ISP_TO_CAM_PMU1_RESET_L GPIO_ISP_TO_CAM_PMU1_RESET_L 12


Pulldowns on CG board, B2B on BG board
55 507 GPIO_CAM_PMU1_TO_IRCAM_SHDN_L_1V8 55 507
#: 43110946
R5550 100K 5% 1/32W TK 1005 ROOM=NFC 117500065
NTC_STROBE_MODULE
55 65 503 55 65 503
R5551 19.1K 1% 1/32W TK 1005 ROOM=B2B_BGFLEX 118500048

Apple Proprietary and Confidential

SYNC_MASTER=d07_mlb_sg_9.1.0 SYNC_DATE=03/21/2012

PAGE TITLE

CAMERA: PMU 1: Aliases (55)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Actuator Supply

Place C6249 and C6250 next to VDD_SW(A5) and VSS_SW(A3)
C6270 is for C4 pad

39 PP_VDD_MAIN
39 PP_VDD_BOOST

C6272 15UF 20% 6.3V X5R 0402-1 ROOM=RCAM_ALEX 138S00003 — VDDMAIN
C6250 2.2UF 20% 6.3V CER-X5R 0201-1 138S00450 ROOM=RCAM_ALEX — VDD_SW
C6249 220PF 5% 25V CER-C0G 1005 ROOM=RCAM_ALEX 131S00543 — VDD_SW
C6270 0.1UF 20% 6.3V X5R-CERM 1005 ROOM=RCAM_ALEX 131S00518 — VDDMAIN
C6271 0.1UF 20% 6.3V X5R-CERM 1005 ROOM=RCAM_ALEX 131S00518 — VDDHI

RESET*: Req external PD, VDD_MAIN logic level
55 GPIO_CAM_PMU1_TO_PVDD_RESET_L_HV
R6250 100K 5% 1/32W TK 1005 ROOM=RCAM_ALEX 117S00065

U6250
D2748
CSP-1
338S00616
CRITICAL

B1	VDDHI		
A5	VDD_SW		
C4	VDDMAIN		
B4	RESET*	BUCK_LX	A4 LX_BUCK_ALEX, DIDT=TRUE
C5	NHI_TEMP	BOOST_LX	A2 LX_BOOST_ALEX, DIDT=TRUE
C1	SCL	VOUT	A1
C2	SDA	VOUT_FB	B3 ANALOG_FB_ALEX
ROOM=RCAM_ALEX		VBOOT	B2 ALEX_BOOST
		IOUT_SNS	B5 ALEX_IOUT_SNS
C3	VSS	VSS_SW	A3

55 I2C2_CAM_PMU1_SCL_1V8
55 I2C2_CAM_PMU1_SDA_1V8

CRITICAL
L6250
0.47UH-2.9A-0.072OHM
PIJI1608FE-SM
152S00982
ROOM=RCAM_ALEX

132S00283
C6260
6800PF
10% 16V X5R 1005
ROOM=RCAM_ALEX
NO_XNET_CONNECTION

ALEX_BOOT 62

PPVAR_RCAM_PVDD: I_Load = 450mA (MAX)

PPVAR_RCAM_PVDD 506

C6255 330PF 10% 16V X7R 1005 ROOM=RCAM_ALEX 135S00258
C6251 10UF 20% 10V X5R-CERM 0402-8 ROOM=RCAM_ALEX 138S00979
C6252 10UF 20% 10V X5R-CERM 0402-8 ROOM=RCAM_ALEX 138S00979
C6253 10UF 20% 10V X5R-CERM 0402-8 ROOM=RCAM_ALEX 138S00979
C6254 10UF 20% 10V X5R-CERM 0402-8 ROOM=RCAM_ALEX 138S00979
C6256 10UF 20% 10V X5R-CERM 0402-8 ROOM=RCAM_ALEX 138S00979
C6257 10UF 20% 10V X5R-CERM 0402-8 ROOM=RCAM_ALEX 138S00979

XW6250
SHORT-20L-0.05MM-SM
ROOM=RCAM_ALEX 998-03569

XW6251
SHORT-20L-0.05MM-SM
ROOM=RCAM_ALEX 998-03569
AMUX_RCAM_PVDD 38

XW6200
SHORT-20L-0.05MM-SM
ROOM=RCAM_ALEX 998-03569
AMUX_PMU_FROM_ALEX_CAM_PMU 38 54

[LAYOUT] IOUT_SNS: <14pF max parasitic cap

Apple Proprietary and Confidential

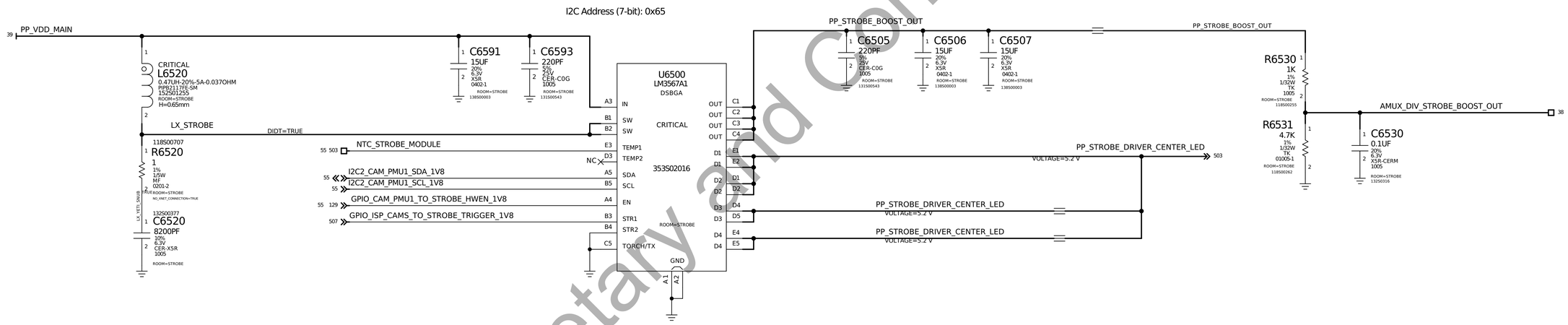
PAGE TITLE
CAMERA: Actuator Supply (Alex) (62)

Apple Inc.

DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

LED STROBE DRIVER



Apple Proprietary and Confidential

PAGE TITLE

CAMERA: Strobe Driver (65)

Apple Inc.

DRAWING NUMBER

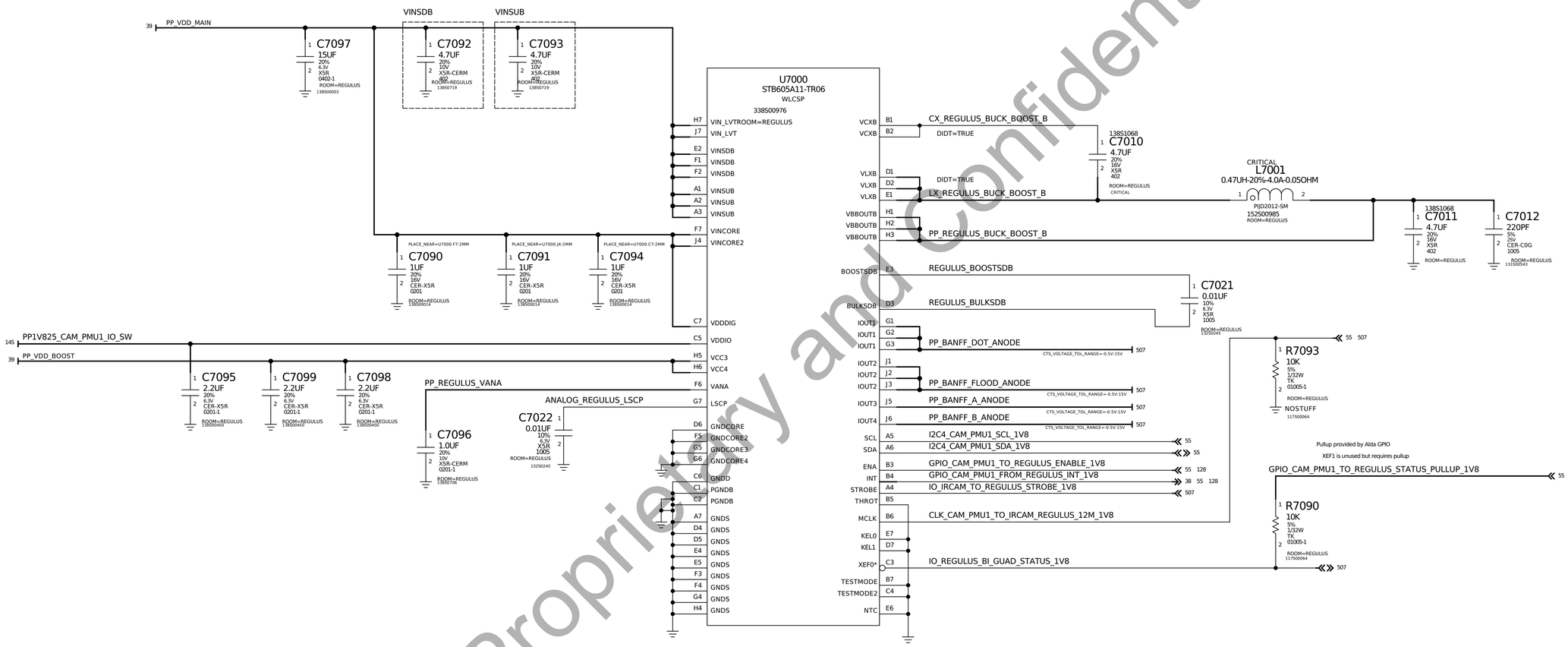
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

VCSEL DRIVER

SUBSYSTEM SPECIFIC BOM TABLES

INDUCTOR: Alt covered with PMU inductor BOM table



Apple Proprietary and Confidential

PAGE TITLE
VCSEL Driver (70)

Apple Inc.

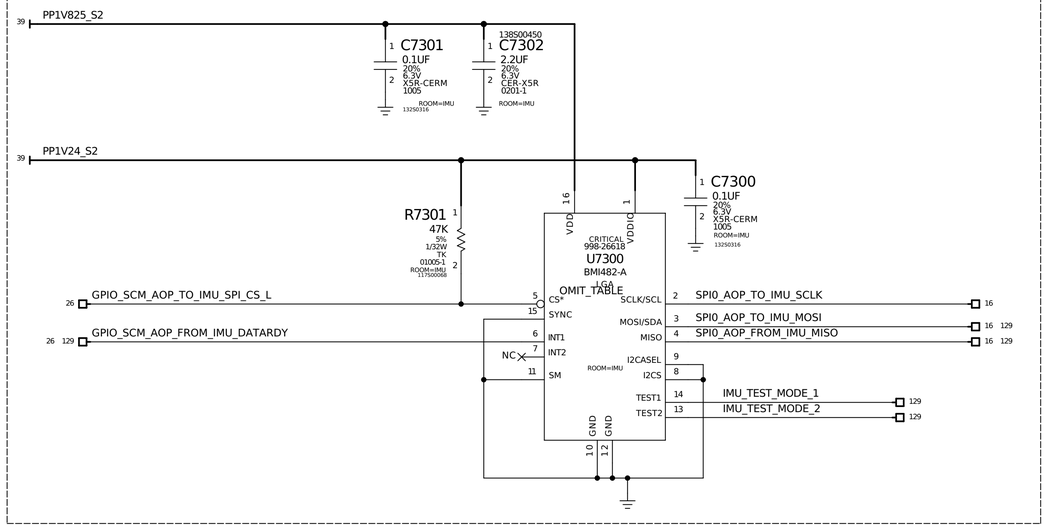
DRAWING NUMBER

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

IMU - ACCEL & GYRO

IMU



Apple Proprietary and Confidential

PAGE TITLE
SENSORS: Accel / Gyro (73)

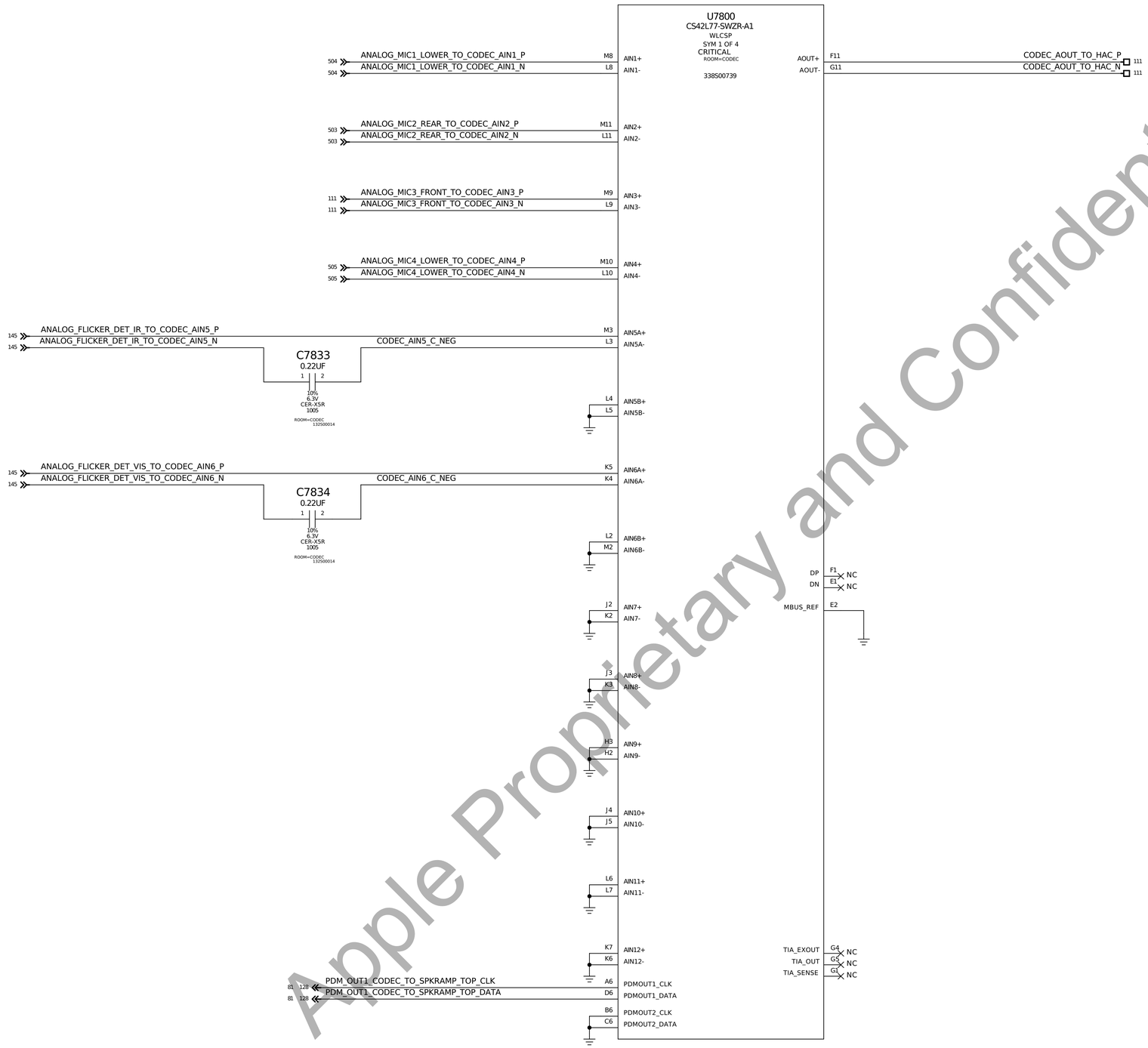
DRAWING NUMBER

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

AUDIO CODEC (ANALOG INPUTS & OUTPUTS)



Apple Proprietary and Confidential

PAGE TITLE
AUDIO: Codec: Analog (1/2) (78)

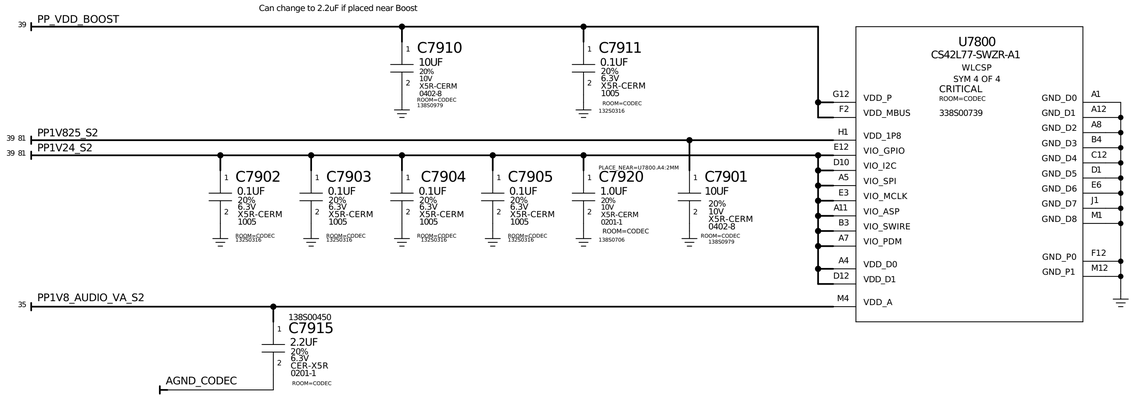
Apple Inc.

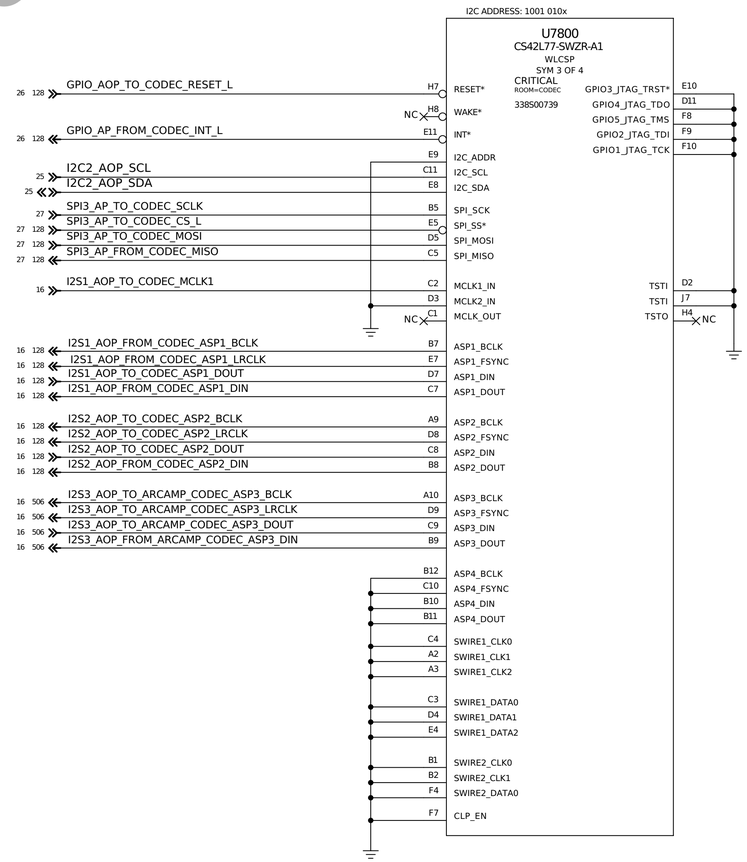
DRAWING NUMBER

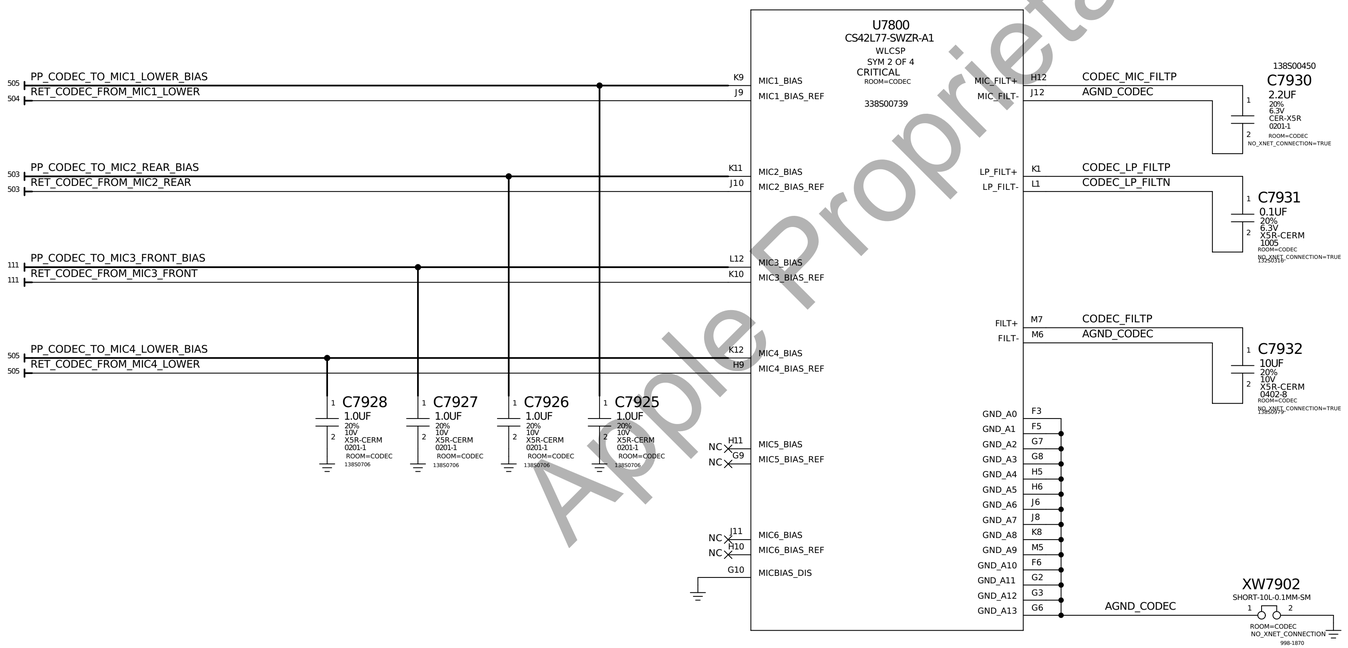
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

AUDIO CODEC (POWER & I/O)







Apple Proprietary and Confidential

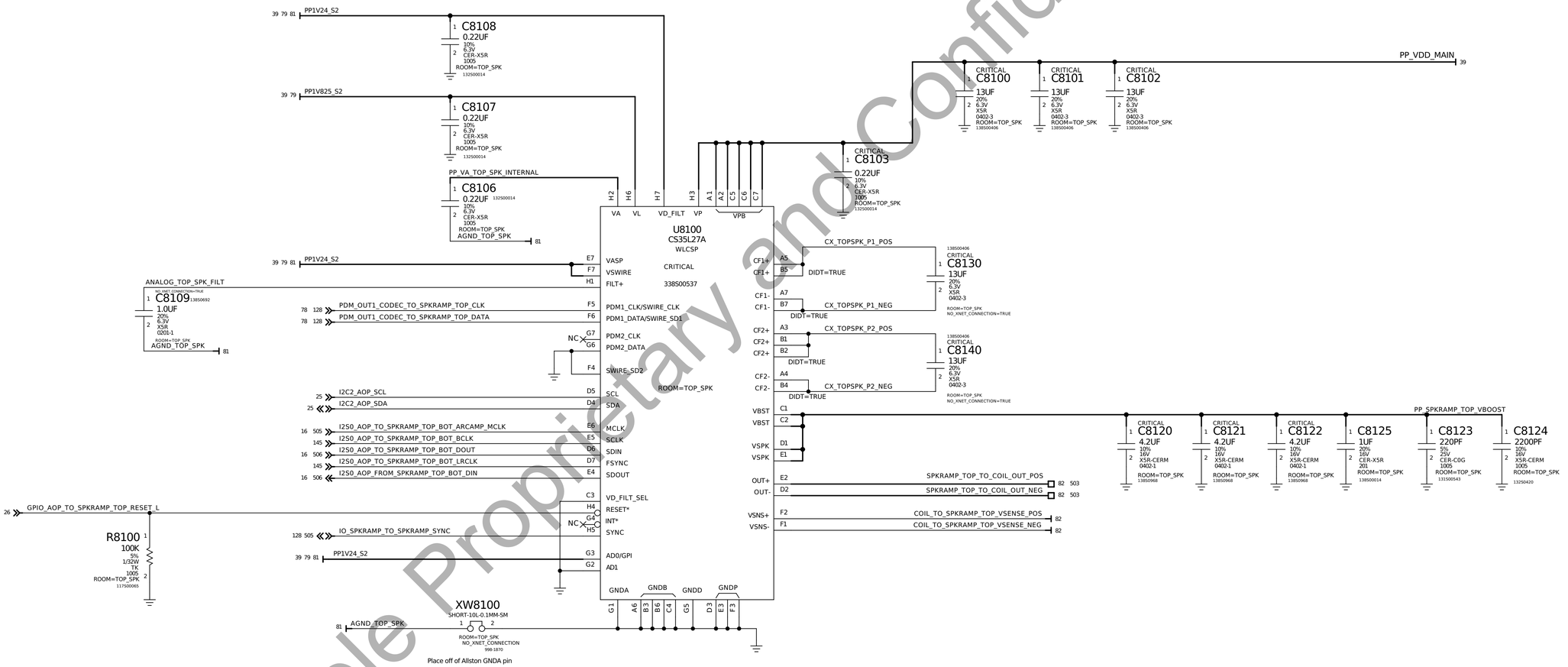
PAGE TITLE
AUDIO: Codec: Power & I/O (2/2) (79)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

TOP SPEAKER AMP


PP1V24_S2
C8108 0.22UF 10% 6.3V CER-X5R 1005 ROOM=TOP_SPK 132500014
PP1V825_S2
C8107 0.22UF 10% 6.3V CER-X5R 1005 ROOM=TOP_SPK 132500014
PP_VA_TOP_SPK_INTERNAL
C8106 0.22UF 10% 6.3V CER-X5R 1005 ROOM=TOP_SPK AGND_TOP_SPK 132500014
PP_VDD_MAIN
CRITICAL C8100 13UF 20% 6.3V X5R 0402-3 ROOM=TOP_SPK 138500406
CRITICAL C8101 13UF 20% 6.3V X5R 0402-3 ROOM=TOP_SPK 138500406
CRITICAL C8102 13UF 20% 6.3V X5R 0402-3 ROOM=TOP_SPK 138500406
CRITICAL C8103 0.22UF 10% 6.3V CER-X5R 1005 ROOM=TOP_SPK 132500014
U8100
CS35L27A
WLCSP
VA VL VD_FILT VP VPB
VASP VSWIRE FILT+ CRITICAL 338S00537
PDM1_CLK/SWIRE_CLK PDM1_DATA/SWIRE_SD1 PDM2_CLK PDM2_DATA SWIRE_SD2 ROOM=TOP_SPK
SCL SDA MCLK SCLK SDIN FSYNC SDOUT
VD_FILT_SEL RESET* INT* SYNC AD0/GPI AD1
GNDA GNDB GNDD GNDP
ANALOG_TOP_SPK_FILT
C8109 1.0UF 20% 6.3V X5R 0201-1 ROOM=TOP_SPK AGND_TOP_SPK 138500692
PDM_OUT1_CODEC_TO_SPKRAMP_TOP_CLK
PDM_OUT1_CODEC_TO_SPKRAMP_TOP_DATA
I2C2_AOP_SCL
I2C2_AOP_SDA
I2S0_AOP_TO_SPKRAMP_TOP_BOT_ARCAMP_MCLK
I2S0_AOP_TO_SPKRAMP_TOP_BOT_BCLK
I2S0_AOP_TO_SPKRAMP_TOP_BOT_DOUT
I2S0_AOP_TO_SPKRAMP_TOP_BOT_LRCLK
I2S0_AOP_FROM_SPKRAMP_TOP_BOT_DIN
GPIO_AOP_TO_SPKRAMP_TOP_RESET_L
R8100 100K 5% 1/32W TK 1005 ROOM=TOP_SPK 117500065
IO_SPKRAMP_TO_SPKRAMP_SYNC
PP1V24_S2
XW8100 SHORT-10L-0.1MM-SM ROOM=TOP_SPK NO_XNET_CONNECTION 998-1870
AGND_TOP_SPK
Place off of Allston GNDA pin
CX_TOPSPK_P1_POS
CX_TOPSPK_P1_NEG
DIDT=TRUE
CRITICAL C8130 13UF 20% 6.3V X5R 0402-3 ROOM=TOP_SPK NO_XNET_CONNECTION=TRUE 138500406
CX_TOPSPK_P2_POS
CX_TOPSPK_P2_NEG
CRITICAL C8140 13UF 20% 6.3V X5R 0402-3 ROOM=TOP_SPK NO_XNET_CONNECTION=TRUE 138500406
PP_SPKRAMP_TOP_VBOOST
CRITICAL C8120 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=TOP_SPK 13850968
CRITICAL C8121 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=TOP_SPK 13850968
CRITICAL C8122 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=TOP_SPK 13850968
C8125 1UF 20% 16V CER-X5R 201 ROOM=TOP_SPK 138500014
C8123 220PF 5% 25V CER-C0G 1005 ROOM=TOP_SPK 131500543
C8124 2200PF 10% 16V X5R-CERM 1005 ROOM=TOP_SPK 132504200
SPKRAMP_TOP_TO_COIL_OUT_POS
SPKRAMP_TOP_TO_COIL_OUT_NEG
COIL_TO_SPKRAMP_TOP_VSENSE_POS
COIL_TO_SPKRAMP_TOP_VSENSE_NEG

Apple Proprietary and Confidential

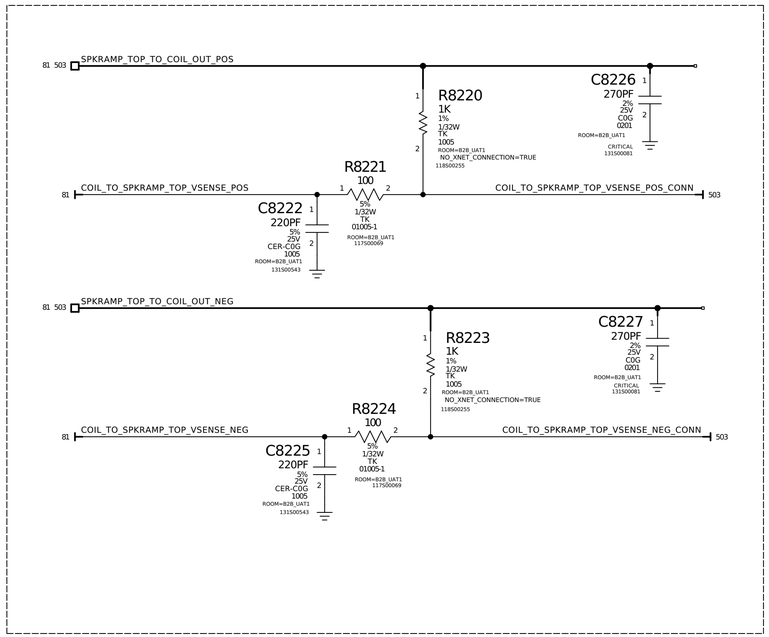
PAGE TITLE
AUDIO: Top Speaker Amp (81)

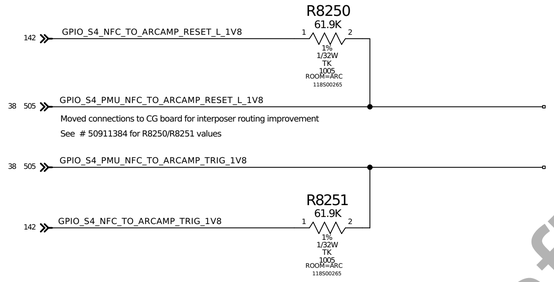
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

TOP Speaker Filters





Apple Proprietary and Confidential

PAGE TITLE
AUDIO: CG Misc. (82)

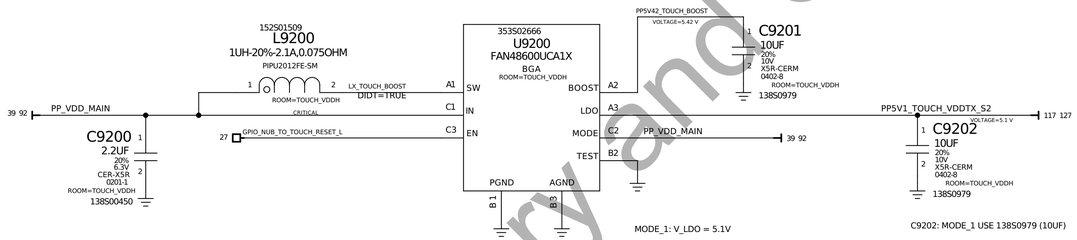
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
152S00824	152S01509	L9200	TAIYO,1UH,20%,2A,69MO,H=0.65,2012

Touch Power



Apple Proprietary and Confidential

PAGE TITLE
TOP MODULE: Touch Power (92)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

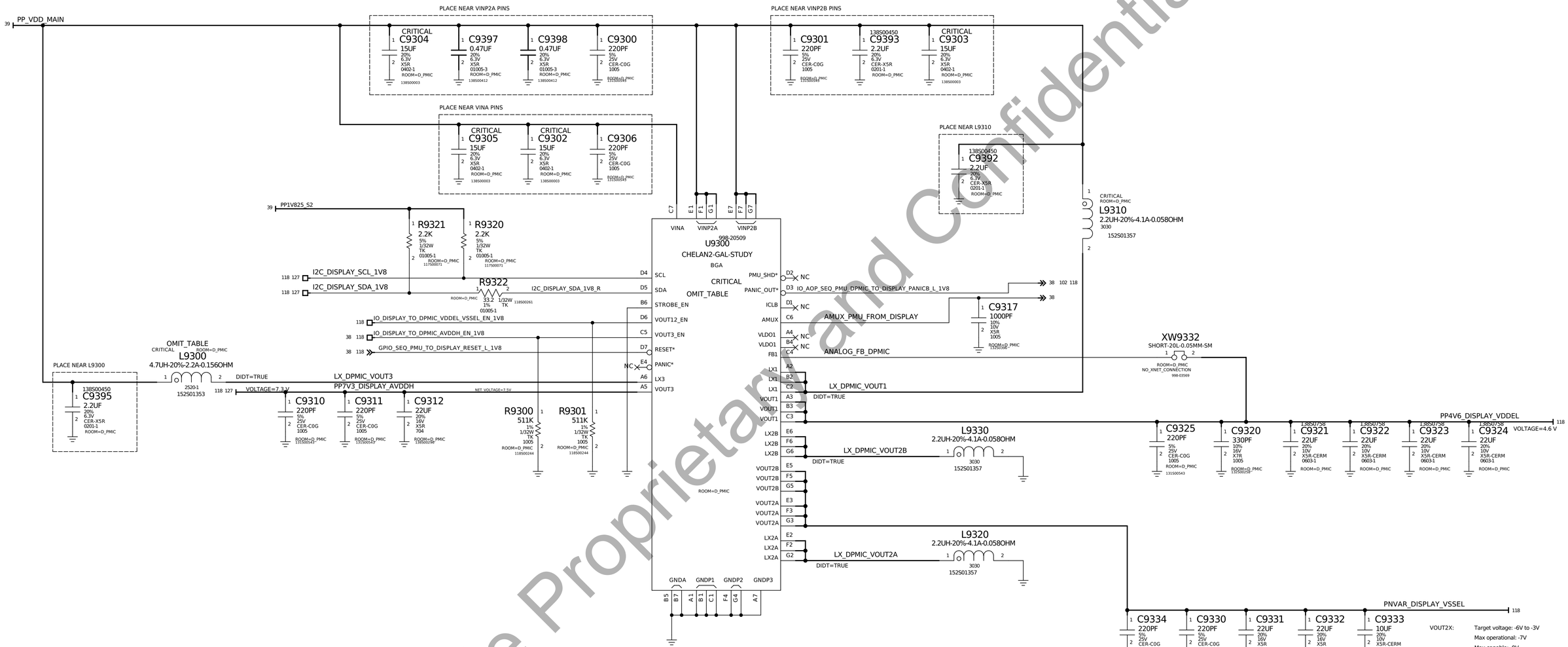
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

DISPLAY PMIC

PART NUMBER	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
338S00578	U9300	C	1	IC,PMU,CHELAN2,S2DOS24,WFP47
152S01355	L9300	C	1	IND,MLD,6.8UH,20%,1.7A,220MO,H=0.95,2520

INDUCTOR ALTERNATES

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
152S01358	152S01357	L9310,L9320,L9330	TAIYO,2.2UH,20%,4A,65MO,H=0.95,3030
152S01356	152S01355	L9300	TAIYO,6.8UH,20%,1.2A,280MO,H=0.95,2520


PP_VDD_MAIN
PLACE NEAR VINP2A PINS
C9304 15UF 20% 6.3V X5R 0402-1 ROOM=D_PMIC 138500003
C9397 0.47UF 20% 6.3V X5R 01005-3 ROOM=D_PMIC 138500412
C9398 0.47UF 20% 6.3V X5R 01005-3 ROOM=D_PMIC 138500412
C9300 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500542
PLACE NEAR VINP2B PINS
C9301 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500542
138S00450 C9393 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=D_PMIC
C9303 15UF 20% 6.3V X5R 0402-1 ROOM=D_PMIC 138500003
PLACE NEAR VINA PINS
C9305 15UF 20% 6.3V X5R 0402-1 ROOM=D_PMIC 138500003
C9302 15UF 20% 6.3V X5R 0402-1 ROOM=D_PMIC 138500003
C9306 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500542
PLACE NEAR L9310
138S00450 C9392 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=D_PMIC
PP1V825_S2
R9321 2.2K 5% 1/32W TK 01005-1 ROOM=D_PMIC 117500071
R9320 2.2K 5% 1/32W TK 01005-1 ROOM=D_PMIC 117500071
R9322 33.2 1% 1/32W TK 01005-1 ROOM=D_PMIC 118500261
I2C_DISPLAY_SCL_1V8
I2C_DISPLAY_SDA_1V8
I2C_DISPLAY_SDA_1V8_R
U9300 CHELAN2-GAL-STUDY BGA 998-20509
CRITICAL
OMIT_TABLE
VINA VINP2A VINP2B
SCL SDA STROBE_EN VOUT12_EN VOUT3_EN RESET* PANIC* LX3 VOUT3
PMU_SHD* PANIC_OUT* ICLB AMUX VLDO1 VLDO1 FB1 LX1 LX1 LX1 VOUT1 VOUT1 VOUT1
LX2B LX2B LX2B VOUT2B VOUT2B VOUT2B VOUT2A VOUT2A VOUT2A LX2A LX2A LX2A
GNDA GNDP1 GNDP2 GNDP3
IO_DISPLAY_TO_DPMIC_VDDEL_VSSEL_EN_1V8
IO_DISPLAY_TO_DPMIC_AVDDH_EN_1V8
GPIO_SEQ_PMU_TO_DISPLAY_RESET_L_1V8
IO_AOP_SEQ_PMU_DPMIC_TO_DISPLAY_PANICB_L_1V8
AMUX_PMU_FROM_DISPLAY
ANALOG_FB_DPMIC
C9317 1000PF 10% 10V X5R 1005 ROOM=D_PMIC 131500398
L9310 CRITICAL ROOM=D_PMIC 2.2UH-20%-4.1A-0.058OHM 3030 152S01357
XW9332 SHORT-20L-0.05MM-SM ROOM=D_PMIC NO_XNET_CONNECTION 998-03569
OMIT_TABLE
L9300 CRITICAL ROOM=D_PMIC 4.7UH-20%-2.2A-0.156OHM 2520-1 152S01353
DIDT=TRUE
LX_DPMIC_VOUT3
PP7V3_DISPLAY_AVDDH
VOLTAGE=7.3 V
NET_VOLTAGE=7.5V
PLACE NEAR L9300
138S00450 C9395 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=D_PMIC
C9310 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500543
C9311 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500543
C9312 22UF 20% 16V X5R 704 ROOM=D_PMIC 138500296
R9300 511K 1% 1/32W TK 1005 ROOM=D_PMIC 118500244
R9301 511K 1% 1/32W TK 1005 ROOM=D_PMIC 118500244
LX_DPMIC_VOUT1
LX_DPMIC_VOUT2B
LX_DPMIC_VOUT2A
L9330 2.2UH-20%-4.1A-0.058OHM 3030 152S01357
L9320 2.2UH-20%-4.1A-0.058OHM 3030 152S01357
PP4V6_DISPLAY_VDDEL
VOLTAGE=4.6 V
C9325 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500543
C9320 330PF 10% 16V X7R 1005 ROOM=D_PMIC 132500258
C9321 22UF 20% 10V X5R-CERM 0603-1 ROOM=D_PMIC 138507758
C9322 22UF 20% 10V X5R-CERM 0603-1 ROOM=D_PMIC 138507758
C9323 22UF 20% 10V X5R-CERM 0603-1 ROOM=D_PMIC 138507758
C9324 22UF 20% 10V X5R-CERM 0603-1 ROOM=D_PMIC 138507758
PNVAR_DISPLAY_VSSEL
C9334 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500543
C9330 220PF 5% 25V CER-C0G 1005 ROOM=D_PMIC 131500543
C9331 22UF 20% 16V X5R 704 ROOM=D_PMIC 138500296
C9332 22UF 20% 16V X5R 704 ROOM=D_PMIC 138500296
C9333 10UF 20% 10V X5R-CERM 0402-8 ROOM=D_PMIC 138509979
VOUT2X: Target voltage: -6V to -3V
Max operational: -7V
Max capable: -9V
To GNDP1/GNDP2/GNDP3 directly to GND plane

Apple Proprietary and Confidential

PAGE TITLE

TOP MODULE: Display Power (93)

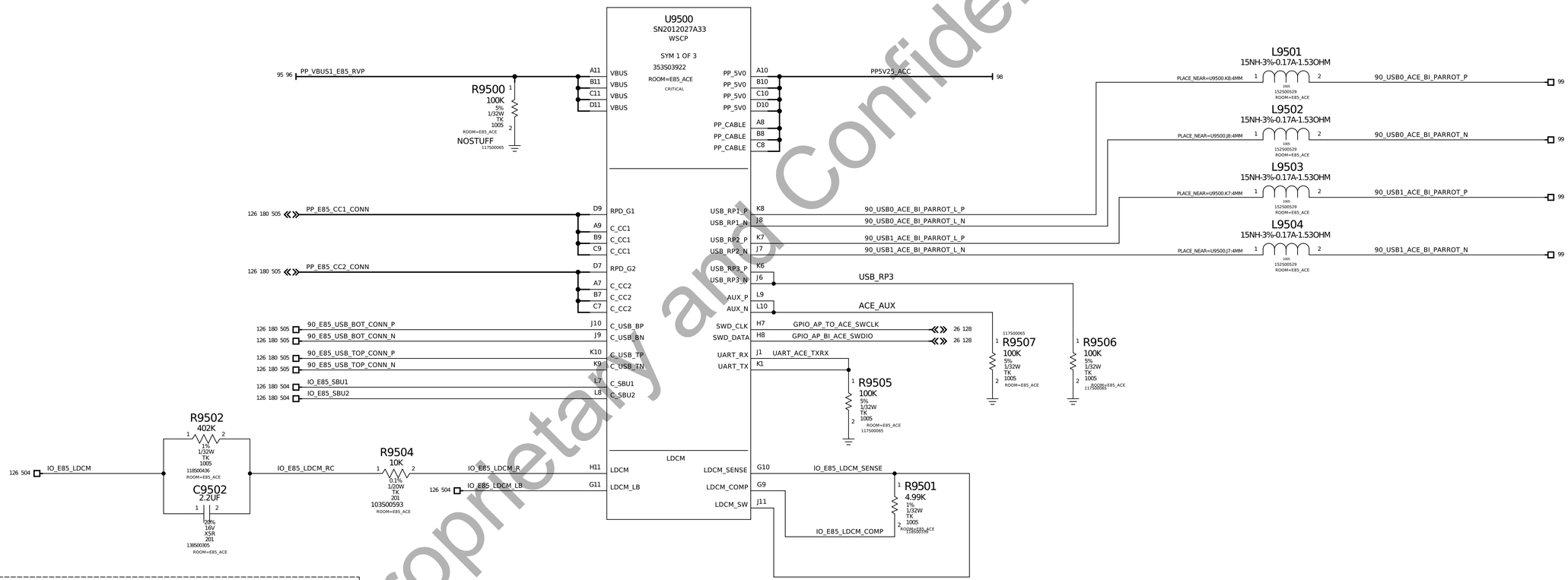
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SUBSYSTEM SPECIFIC BOM TABLES

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
376S00314	376S00125	Q9520	XSTR,PFET,20V,4.2A,0.045 OHM,LGA3
371S0685	371S00318	DZ9520	DIODE,ZENER,10V,5%,250MW,DFN1006-2

PORT CONTROLLER



Apple Proprietary and Confidential

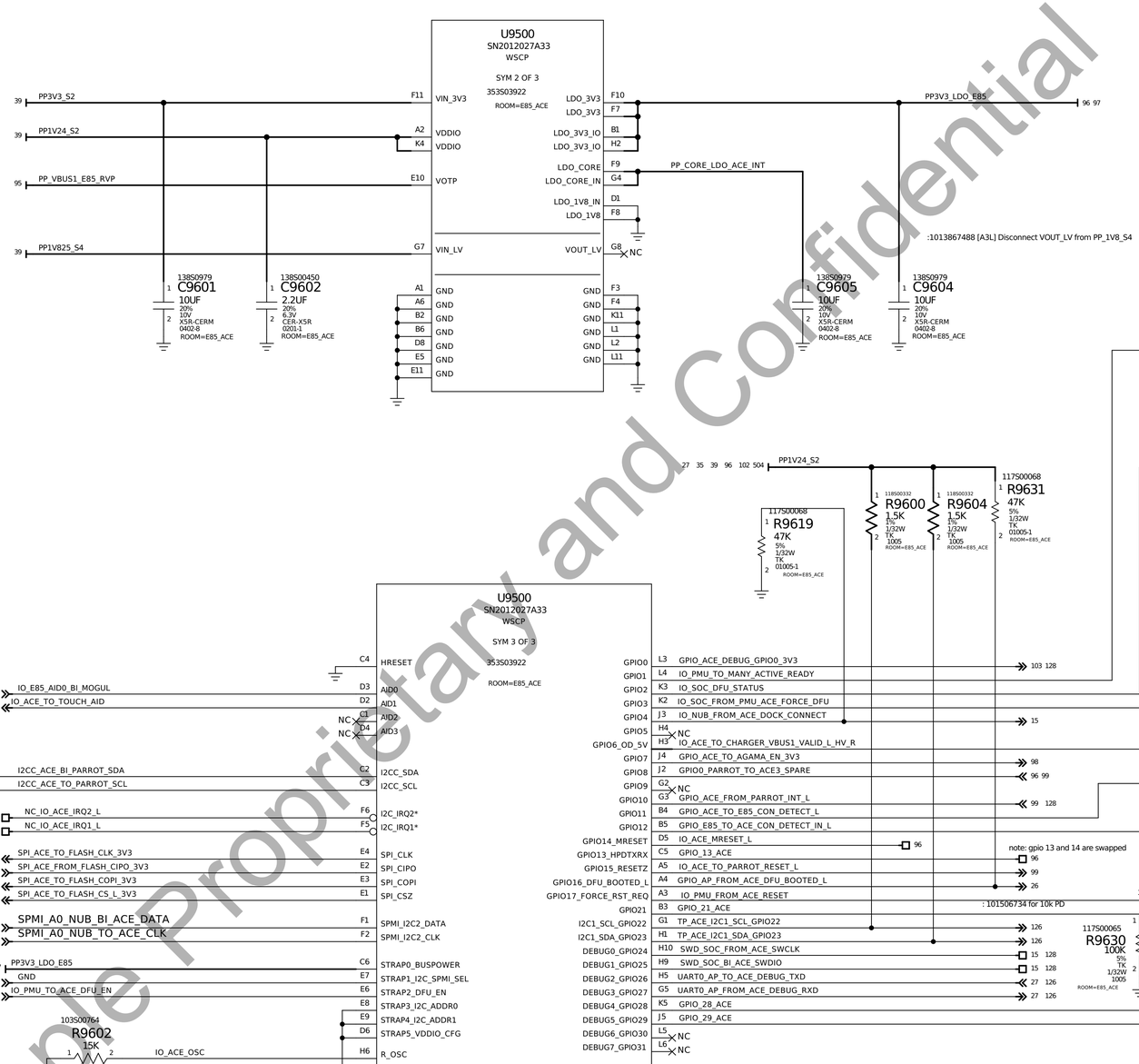
PAGE TITLE
Controller (1/2) (95)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

PORT CONTROLLER



Apple Proprietary and Confidential

PAGE TITLE

E85: Controller (2/2) (96)

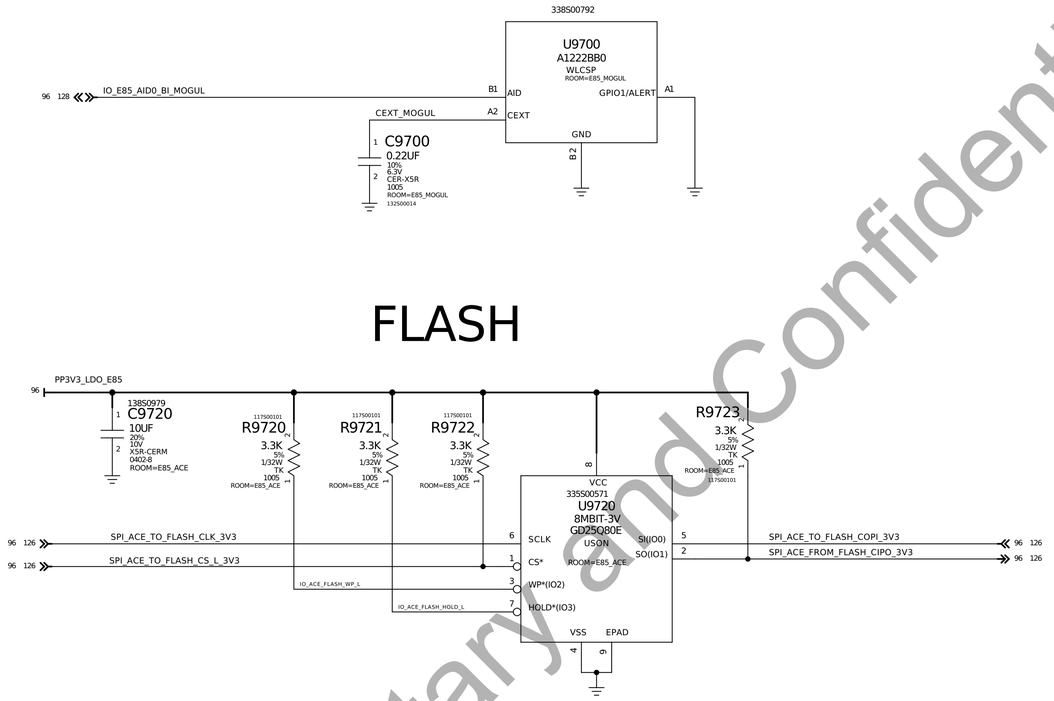
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

FLASH



ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
335S00644	335S00571	U9720	IC,SPI SERIAL FLASH,8MBITS,3.0V,USON8

PAGE TITLE
Flash (97)

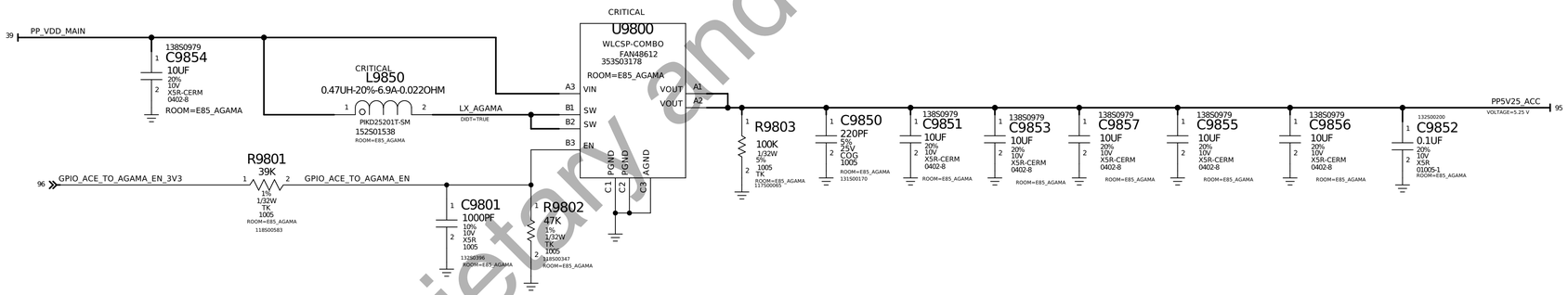
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SUBSYSTEM SPECIFIC BOM TABLES

ACCESSORY POWER



Apple Proprietary and Confidential

PAGE TITLE

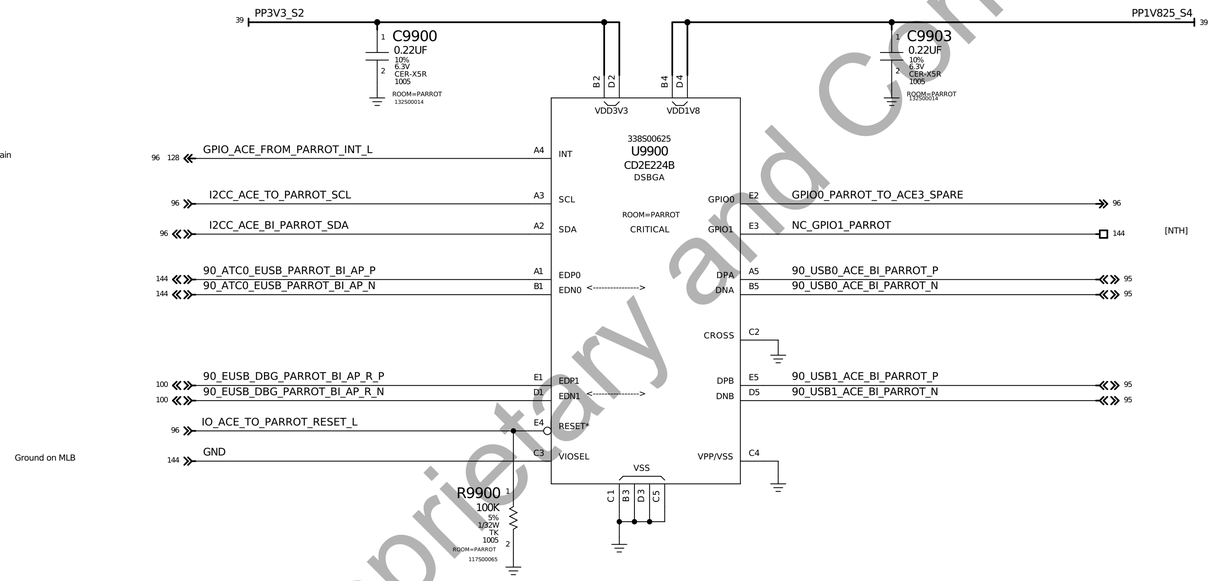
Accessory Power (98)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

USB REPEATER



Apple Proprietary and Confidential

PAGE TITLE

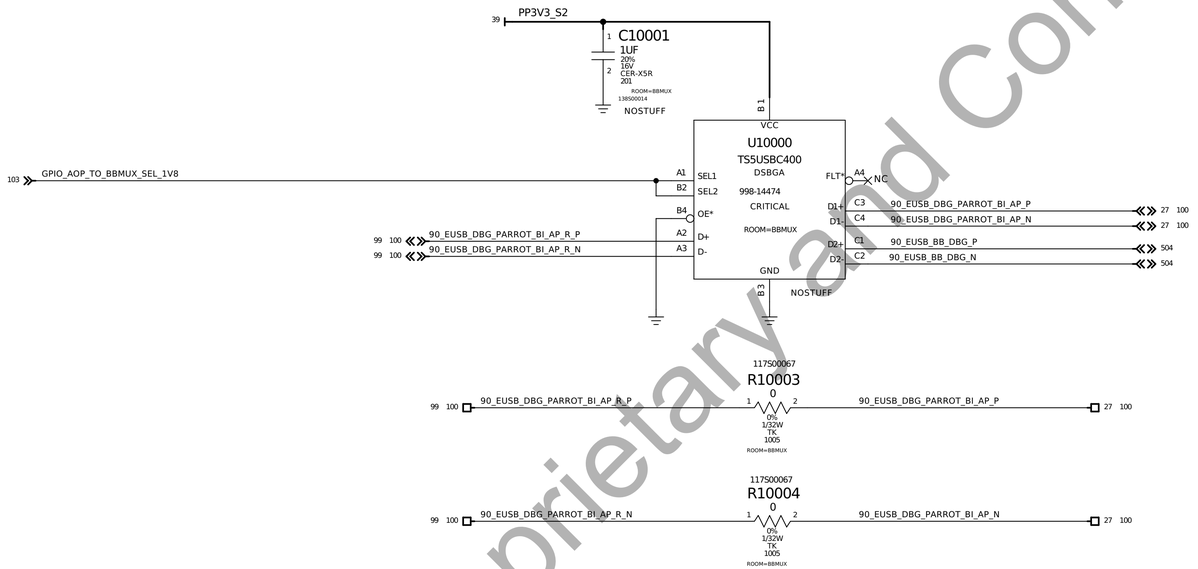
eUSB (99)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

BB USB MUX



Apple Proprietary and Confidential

PAGE TITLE

USB Mux (100)

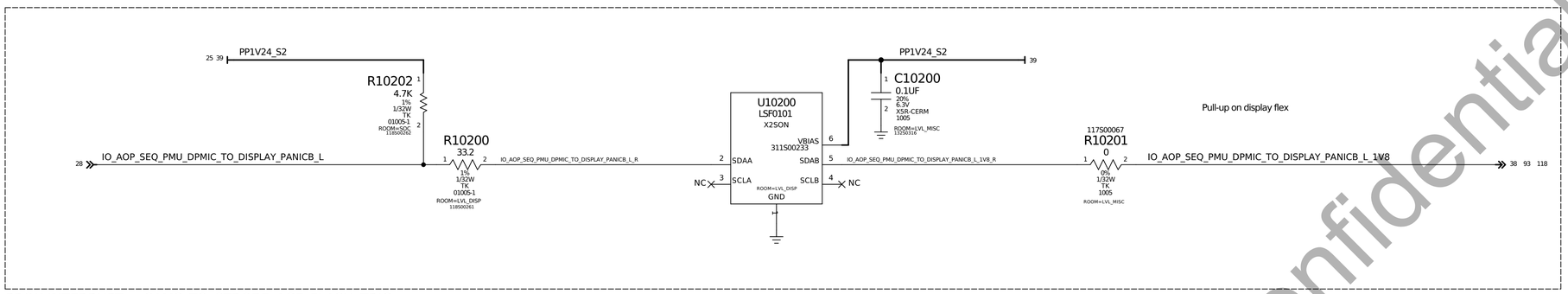
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

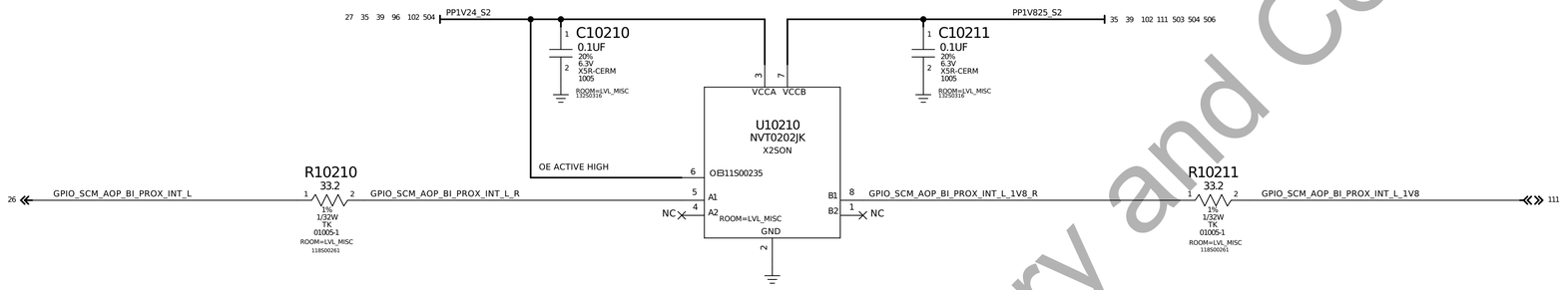
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

LEVEL TRANSLATORS

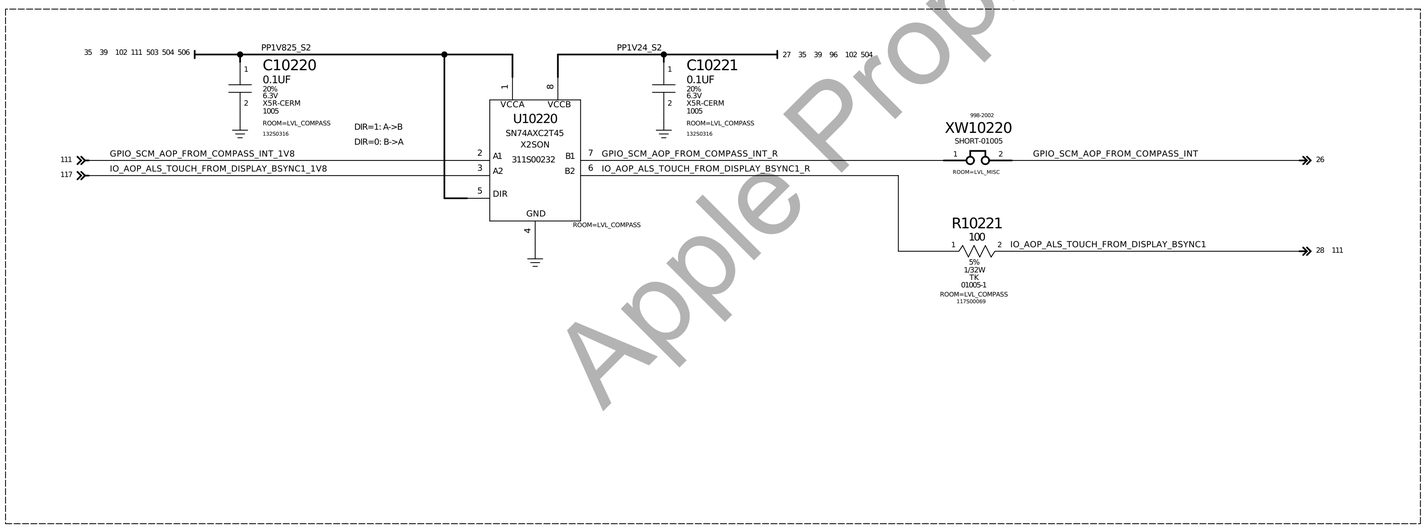
PANICB



PROX INTERRUPT + CAMS_TO_STROBE_ACE_FLASH_TRIG



DISPLAY BSYNC + COMPASS INTERRUPT



Apple Proprietary and Confidential

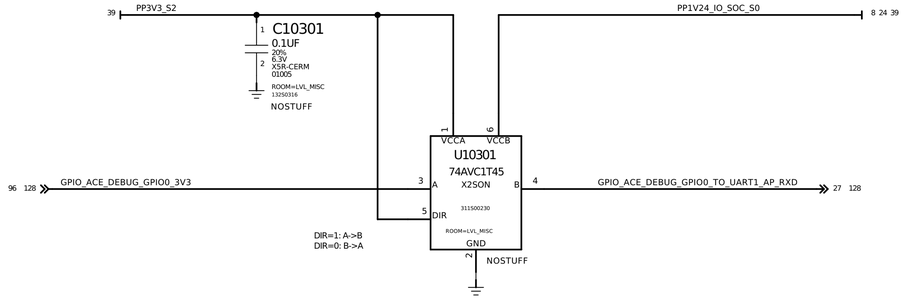
PAGE TITLE
LVL SHIFT: Misc (102)

Apple Inc.

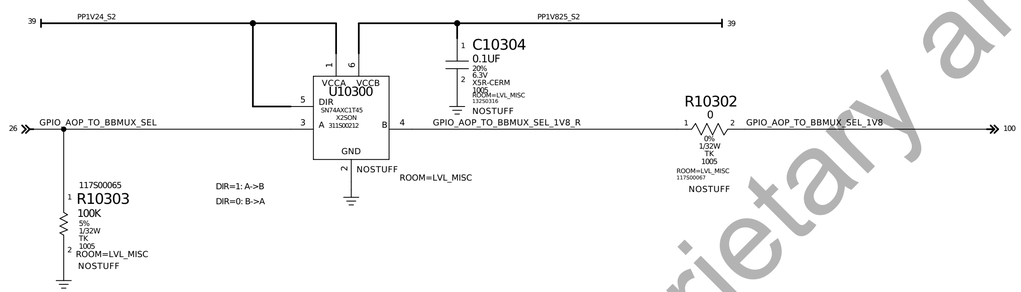
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

ACE DEBUG GPIO0



BBMUX_SEL



Apple Proprietary and Confidential

PAGE TITLE

LVL SHIFT: Misc Nets (103)

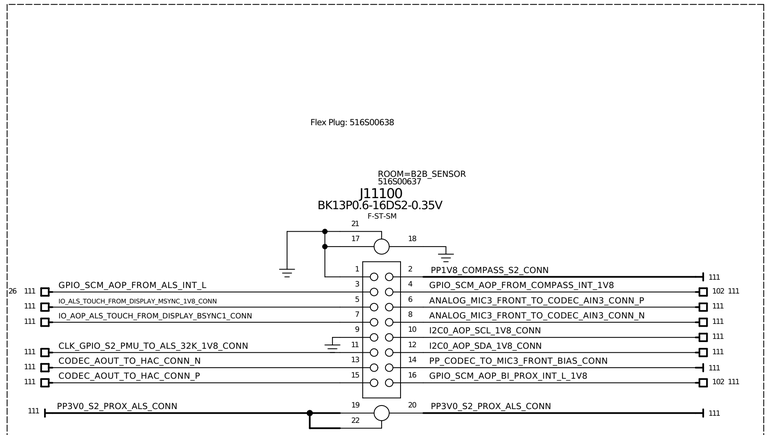
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

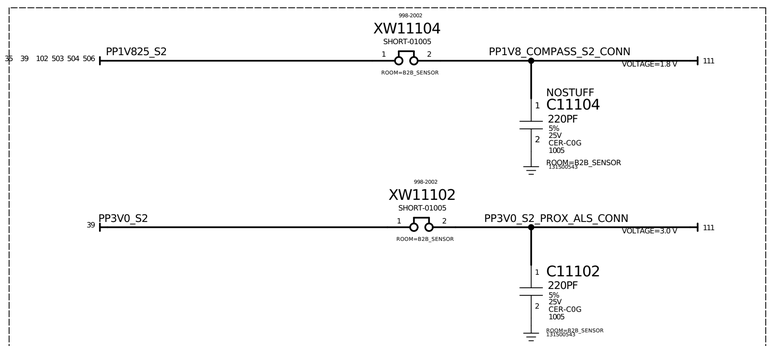
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SENSOR B2B

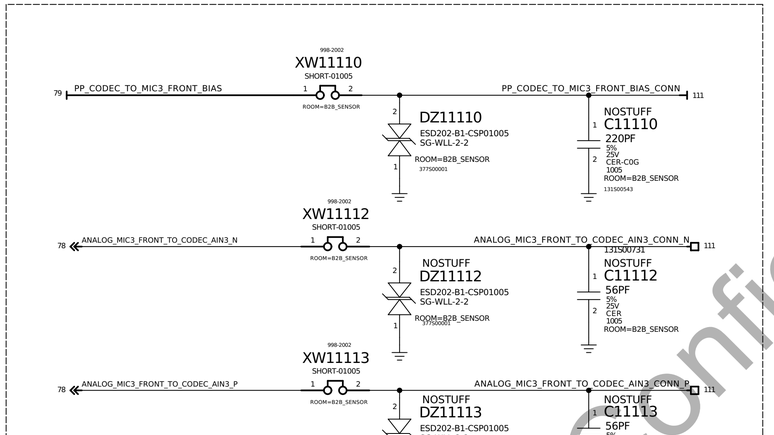
CONNECTOR



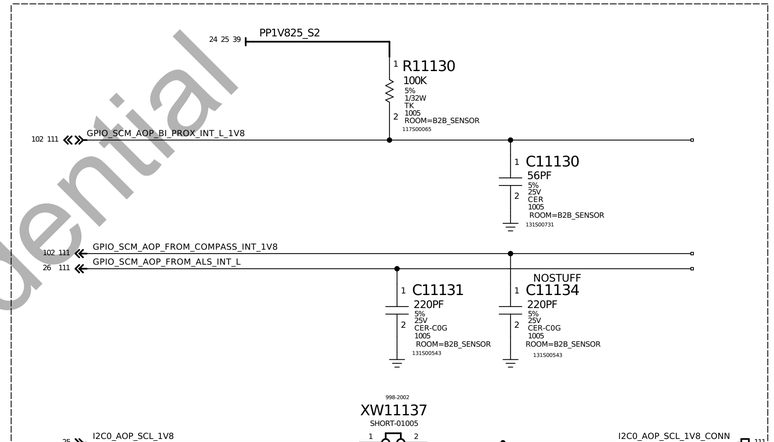
POWER FILTERS



MIC3



IO FILTERS



Apple Proprietary and Confidential

PAGE TITLE

B2B: Sensor (111)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

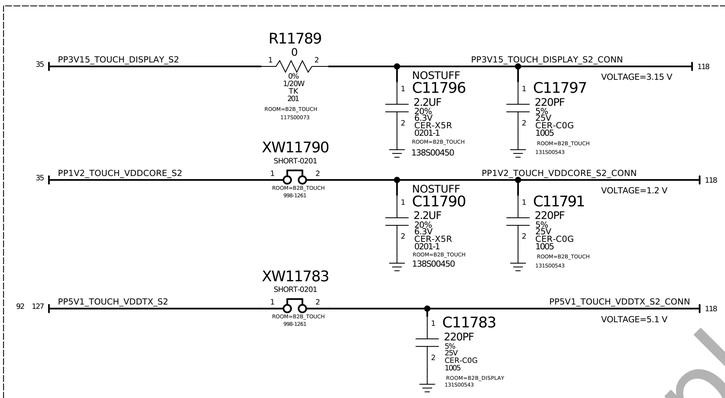
TOUCH B2B

CONNECTOR

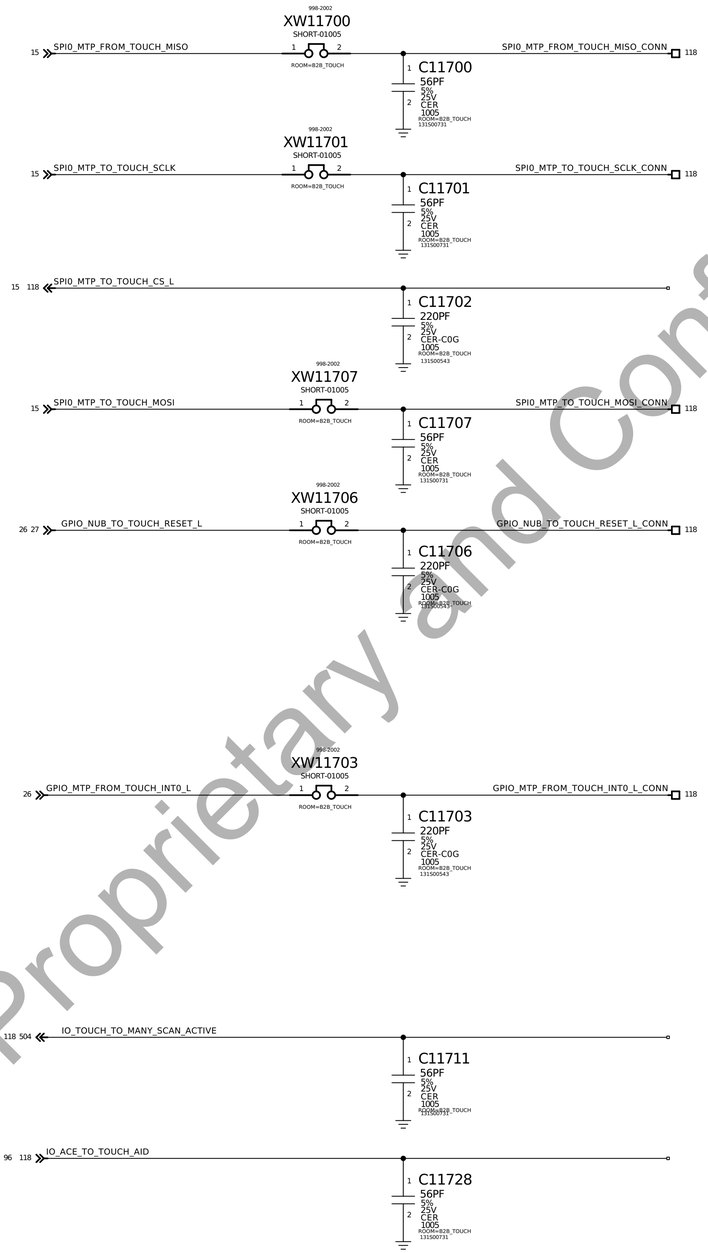
DISPLAY/TOUCH COMBO B2B

MAINTAINED ON NEXT PAGE

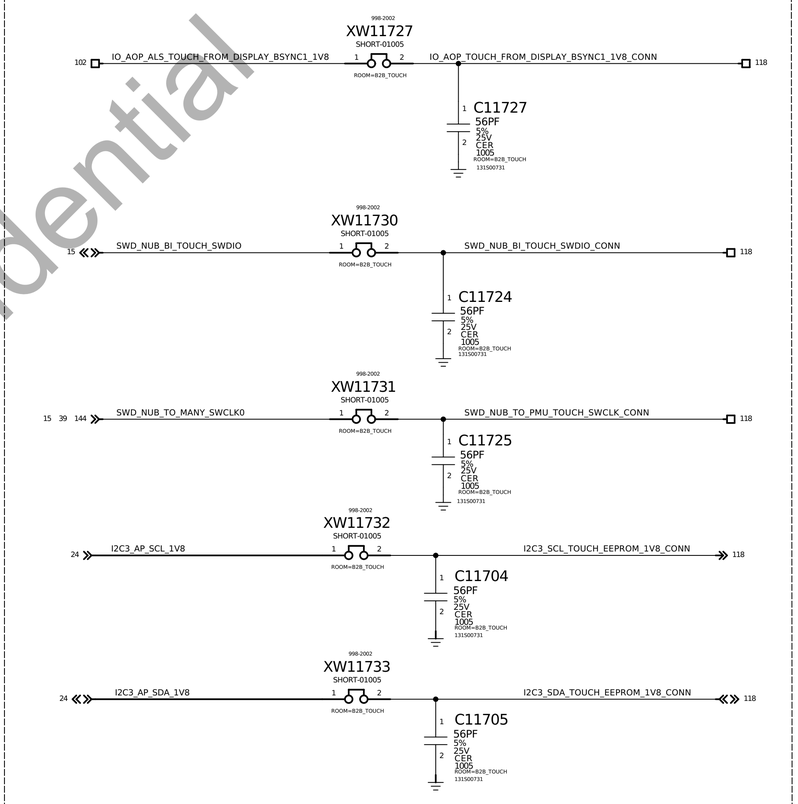
POWER FILTERS



IO FILTERS



IO FILTERS (cont)



Apple Proprietary and Confidential

PAGE TITLE

B2B: Display/Touch Combo (1/2) (117)

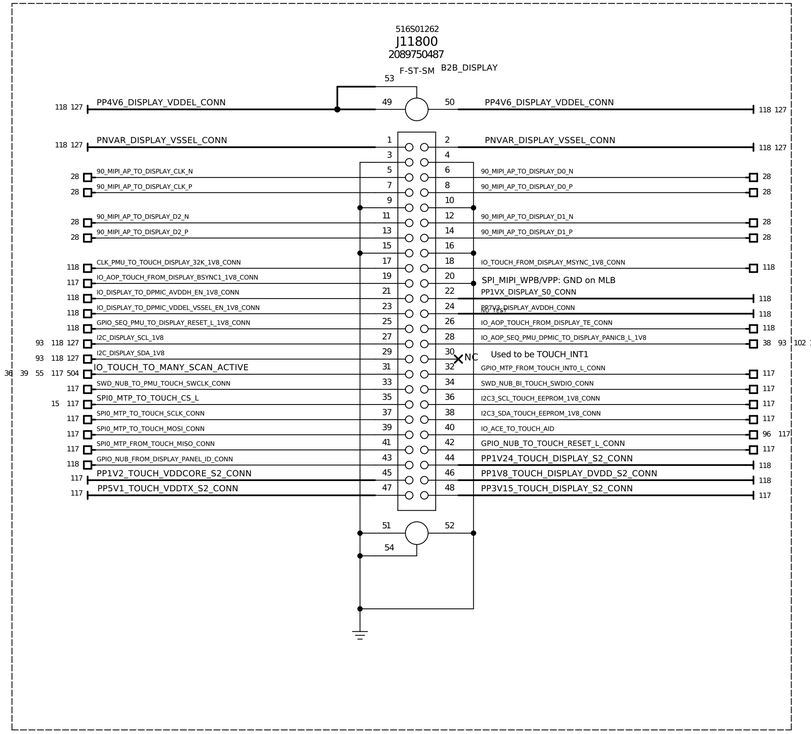
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

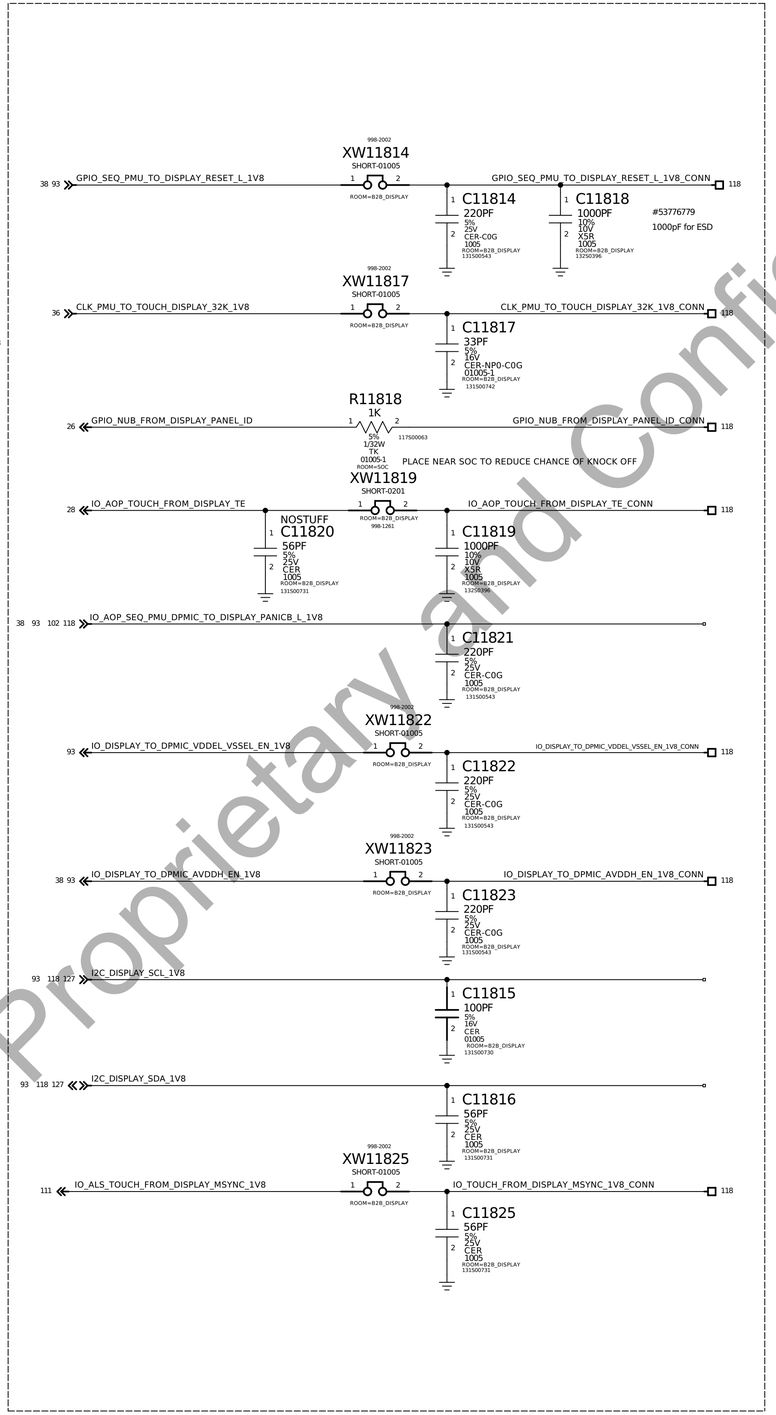
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

DISPLAY B2B

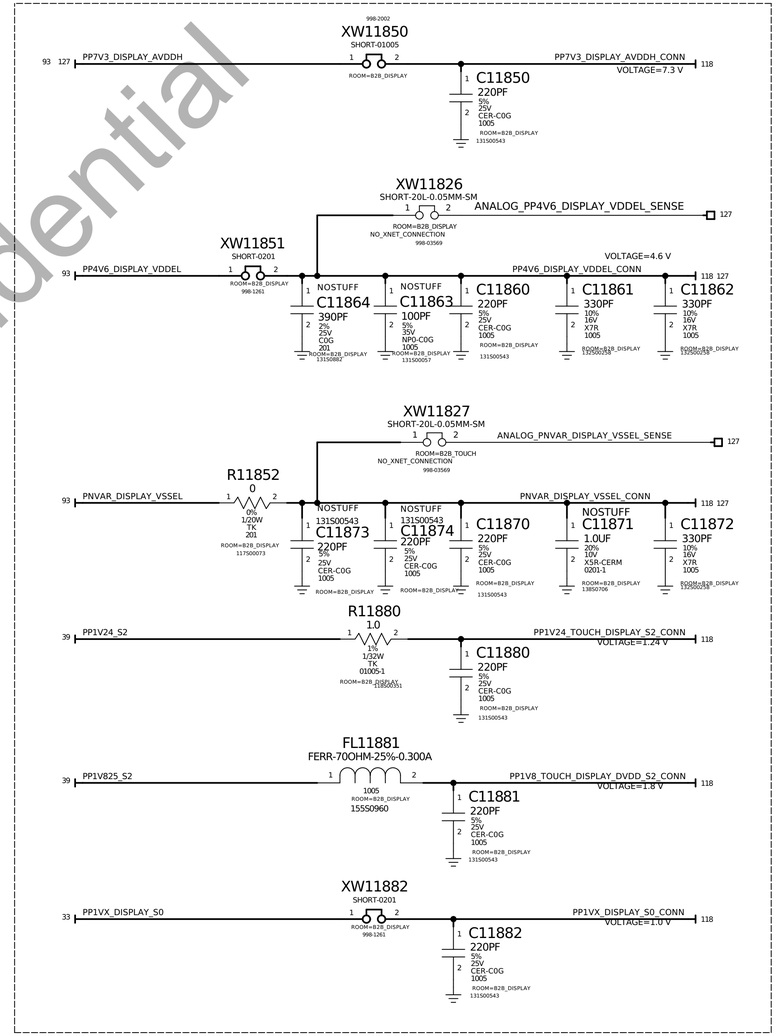
CONNECTOR



IO FILTERS



POWER FILTERS



Apple Proprietary and Confidential

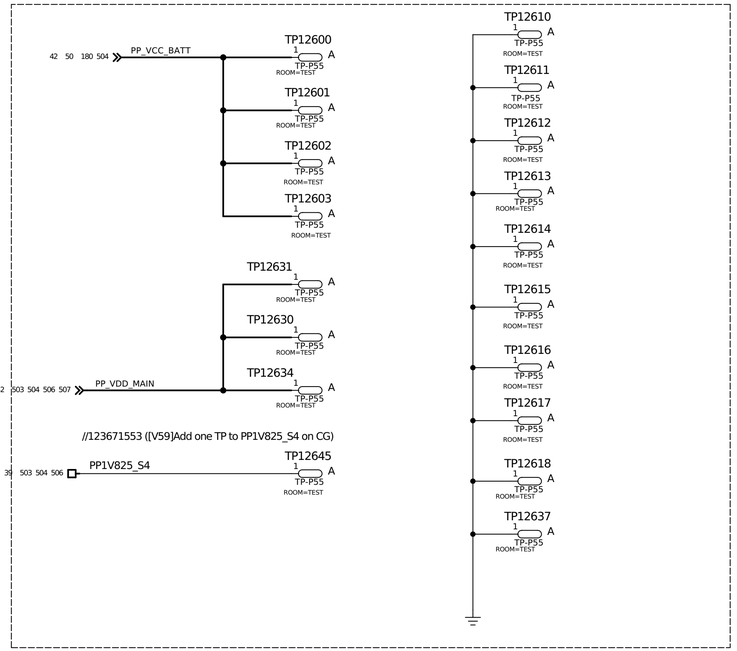
PAGE TITLE
B2B: Display/Touch Combo (2/2) (118)

Apple Inc.

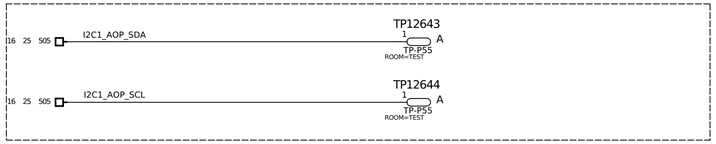
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Test Points

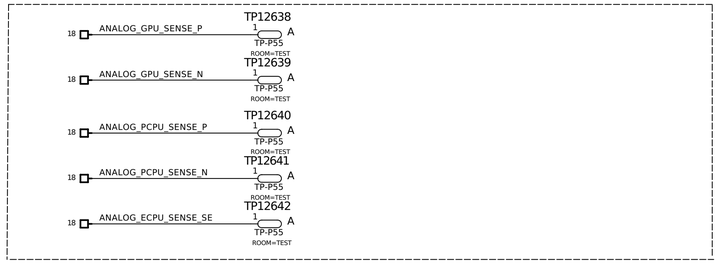
Power + GND



DOCK



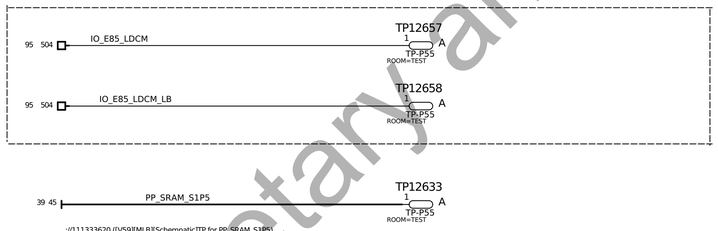
LVCC



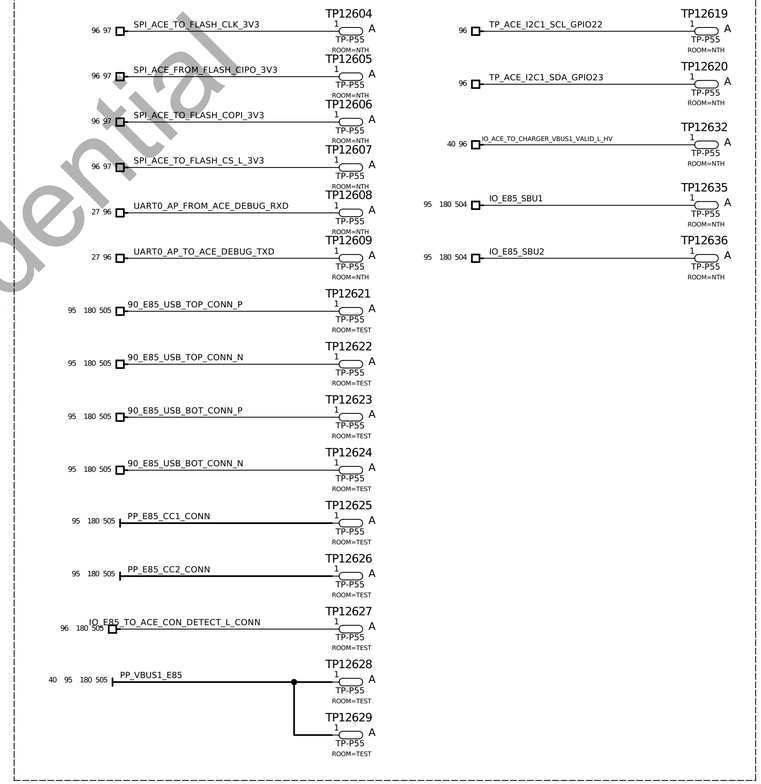
DBB

DFU

LDCM



E85



Apple Proprietary and Confidential

PAGE TITLE

TESTING: Test Points (126)

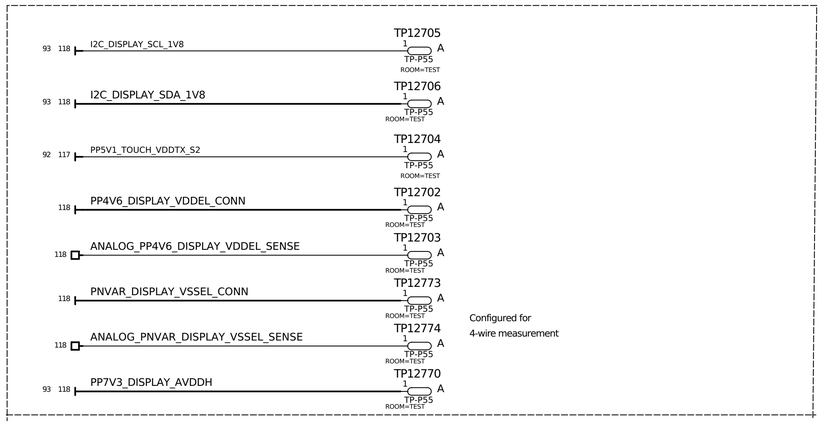
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

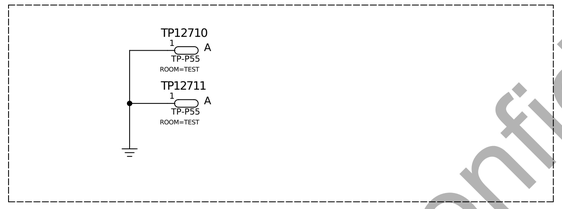
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Test Points (FF Specific)

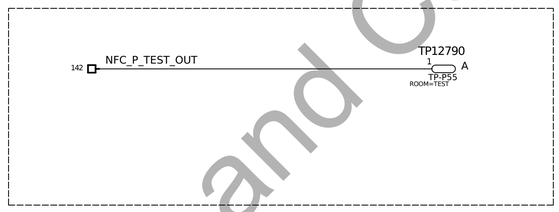
Display + Touch



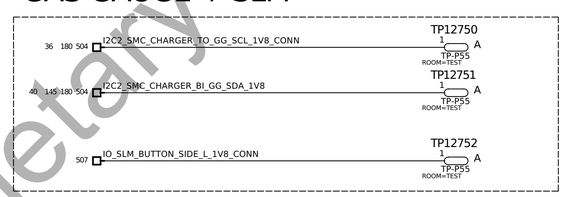
GND



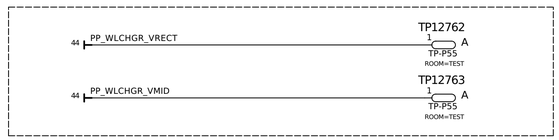
NFC



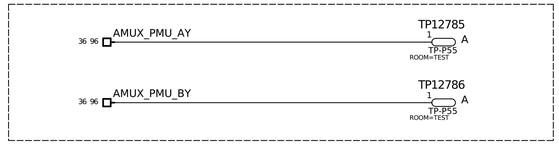
GAS GAUGE + SLM



WLCHGR



AMUX



Apple Proprietary and Confidential

PAGE TITLE
TESTING: Test Points (FF Specific) (127)

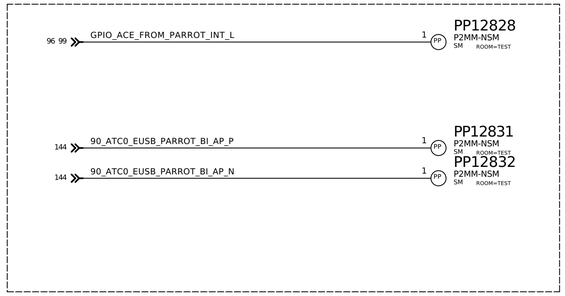
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

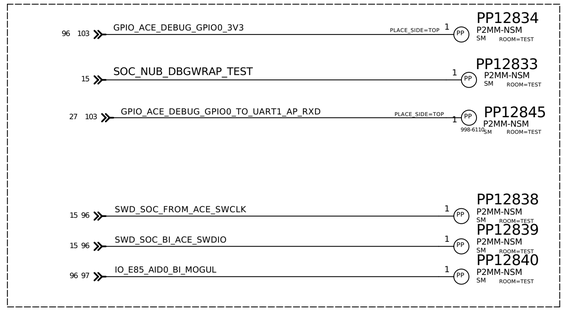
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Probe Points

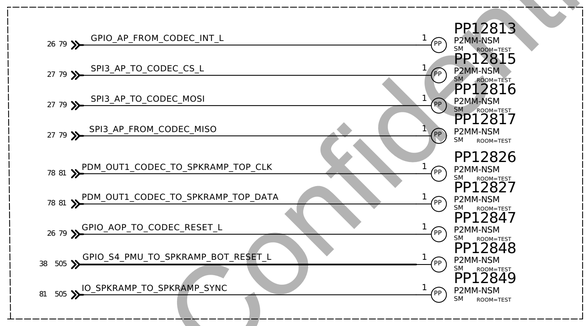
Parrot


96 99 GPIO_ACE_FROM_PARROT_INT_L 1 PP12828 P2MM-NSM SM ROOM=TEST
144 90_ATC0_EUSB_PARROT_BI_AP_P 1 PP12831 P2MM-NSM SM ROOM=TEST
144 90_ATC0_EUSB_PARROT_BI_AP_N 1 PP12832 P2MM-NSM SM ROOM=TEST

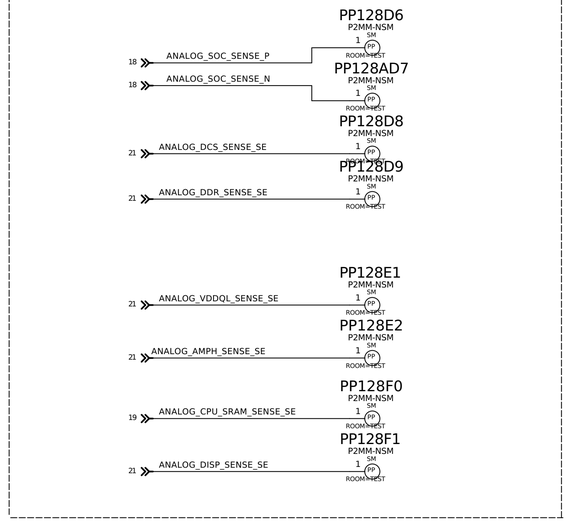
E85


96 103 GPIO_ACE_DEBUG_GPIO0_3V3 PLACE_SIDE=TOP 1 PP12834 P2MM-NSM SM ROOM=TEST
15 SOC_NUB_DBGWRAP_TEST 1 PP12833 P2MM-NSM SM ROOM=TEST
27 103 GPIO_ACE_DEBUG_GPIO0_TO_UART1_AP_RXD PLACE_SIDE=TOP 1 PP12845 998-6116 P2MM-NSM SM ROOM=TEST
15 96 SWD_SOC_FROM_ACE_SWCLK 1 PP12838 P2MM-NSM SM ROOM=TEST
15 96 SWD_SOC_BI_ACE_SWDIO 1 PP12839 P2MM-NSM SM ROOM=TEST
96 97 IO_E85_AID0_BI_MOGUL 1 PP12840 P2MM-NSM SM ROOM=TEST

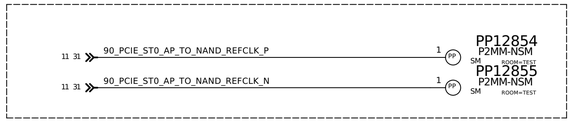
Codec


26 79 GPIO_AP_FROM_CODEC_INT_L 1 PP12813 P2MM-NSM SM ROOM=TEST
27 79 SPI3_AP_TO_CODEC_CS_L 1 PP12815 P2MM-NSM SM ROOM=TEST
27 79 SPI3_AP_TO_CODEC_MOSI 1 PP12816 P2MM-NSM SM ROOM=TEST
27 79 SPI3_AP_FROM_CODEC_MISO 1 PP12817 P2MM-NSM SM ROOM=TEST
78 81 PDM_OUT1_CODEC_TO_SPKRAMP_TOP_CLK 1 PP12826 P2MM-NSM SM ROOM=TEST
78 81 PDM_OUT1_CODEC_TO_SPKRAMP_TOP_DATA 1 PP12827 P2MM-NSM SM ROOM=TEST
26 79 GPIO_AOP_TO_CODEC_RESET_L 1 PP12847 P2MM-NSM SM ROOM=TEST
38 505 GPIO_S4_PMU_TO_SPKRAMP_BOT_RESET_L 1 PP12848 P2MM-NSM SM ROOM=TEST
81 505 IO_SPKRAMP_TO_SPKRAMP_SYNC 1 PP12849 P2MM-NSM SM ROOM=TEST

Bump Sense

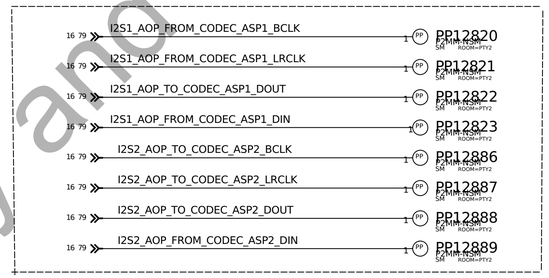

18 ANALOG_SOC_SENSE_P 1 PP128D6 P2MM-NSM SM ROOM=TEST
18 ANALOG_SOC_SENSE_N 1 PP128AD7 P2MM-NSM SM ROOM=TEST
21 ANALOG_DCS_SENSE_SE 1 PP128D8 P2MM-NSM SM ROOM=TEST
21 ANALOG_DDR_SENSE_SE 1 PP128D9 P2MM-NSM SM ROOM=TEST
21 ANALOG_VDDQL_SENSE_SE 1 PP128E1 P2MM-NSM SM ROOM=TEST
21 ANALOG_AMPH_SENSE_SE 1 PP128E2 P2MM-NSM SM ROOM=TEST
19 ANALOG_CPU_SRAM_SENSE_SE 1 PP128F0 P2MM-NSM SM ROOM=TEST
21 ANALOG_DISP_SENSE_SE 1 PP128F1 P2MM-NSM SM ROOM=TEST

PCIe

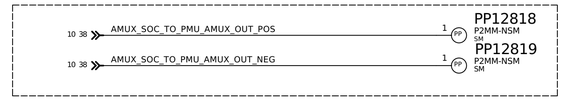

11 31 90_PCIE_ST0_AP_TO_NAND_REFCLK_P 1 PP12854 P2MM-NSM SM ROOM=TEST
11 31 90_PCIE_ST0_AP_TO_NAND_REFCLK_N 1 PP12855 P2MM-NSM SM ROOM=TEST

ACE SWDIO

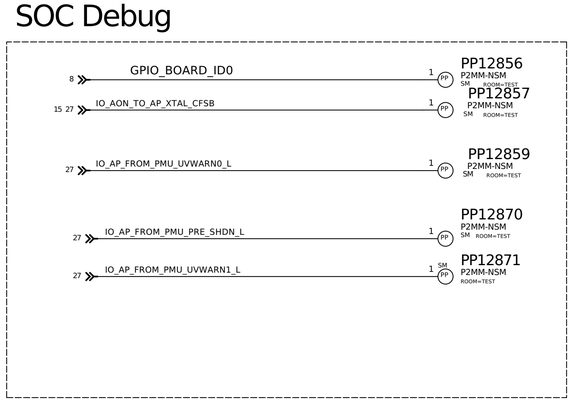
I2S


16 79 I2S1_AOP_FROM_CODEC_ASP1_BCLK 1 PP12820 P2MM-NSM SM ROOM=PTY2
16 79 I2S1_AOP_FROM_CODEC_ASP1_LRCLK 1 PP12821 P2MM-NSM SM ROOM=PTY2
16 79 I2S1_AOP_TO_CODEC_ASP1_DOUT 1 PP12822 P2MM-NSM SM ROOM=PTY2
16 79 I2S1_AOP_FROM_CODEC_ASP1_DIN 1 PP12823 P2MM-NSM SM ROOM=PTY2
16 79 I2S2_AOP_TO_CODEC_ASP2_BCLK 1 PP12886 P2MM-NSM SM ROOM=PTY2
16 79 I2S2_AOP_TO_CODEC_ASP2_LRCLK 1 PP12887 P2MM-NSM SM ROOM=PTY2
16 79 I2S2_AOP_TO_CODEC_ASP2_DOUT 1 PP12888 P2MM-NSM SM ROOM=PTY2
16 79 I2S2_AOP_FROM_CODEC_ASP2_DIN 1 PP12889 P2MM-NSM SM ROOM=PTY2

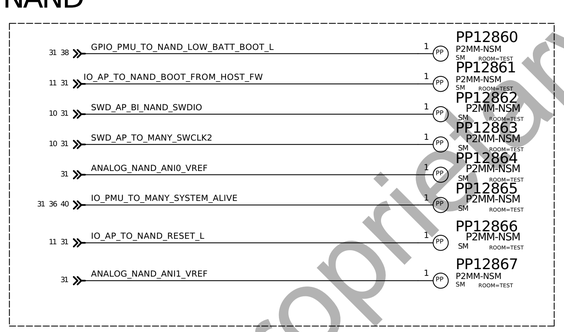
AMUX Probe Points



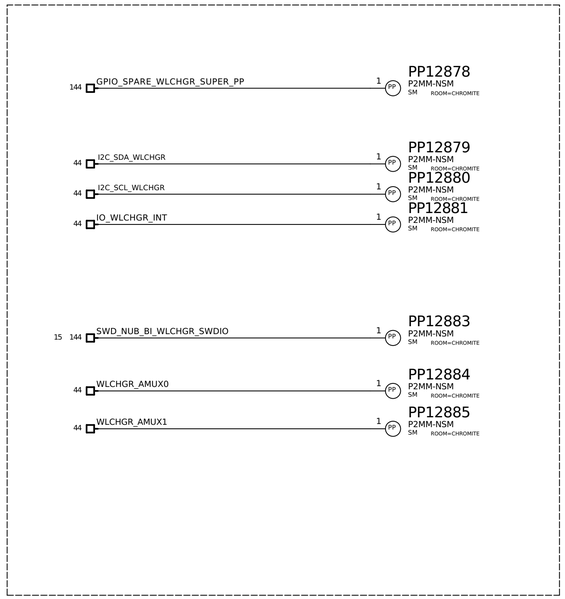
SOC Debug


8 GPIO_BOARD_ID0 1 PP12856 P2MM-NSM SM ROOM=TEST
15 27 IO_AON_TO_AP_XTAL_CFSB 1 PP12857 P2MM-NSM SM ROOM=TEST
27 IO_AP_FROM_PMU_UVWARN0_L 1 PP12859 P2MM-NSM SM ROOM=TEST
27 IO_AP_FROM_PMU_PRE_SHDN_L 1 PP12870 P2MM-NSM SM ROOM=TEST
27 IO_AP_FROM_PMU_UVWARN1_L 1 SM PP12871 P2MM-NSM ROOM=TEST

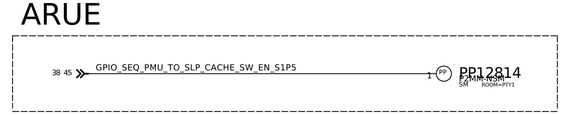
NAND


31 38 GPIO_PMU_TO_NAND_LOW_BATT_BOOT_L 1 PP12860 P2MM-NSM SM ROOM=TEST
11 31 IO_AP_TO_NAND_BOOT_FROM_HOST_FW 1 PP12861 P2MM-NSM SM ROOM=TEST
10 31 SWD_AP_BI_NAND_SWDIO 1 PP12862 P2MM-NSM SM ROOM=TEST
10 31 SWD_AP_TO_MANY_SWCLK2 1 PP12863 P2MM-NSM SM ROOM=TEST
31 ANALOG_NAND_ANI0_VREF 1 PP12864 P2MM-NSM SM ROOM=TEST
31 36 40 IO_PMU_TO_MANY_SYSTEM_ALIVE 1 PP12865 P2MM-NSM SM ROOM=TEST
11 31 IO_AP_TO_NAND_RESET_L 1 PP12866 P2MM-NSM SM ROOM=TEST
31 ANALOG_NAND_ANI1_VREF 1 PP12867 P2MM-NSM SM ROOM=TEST

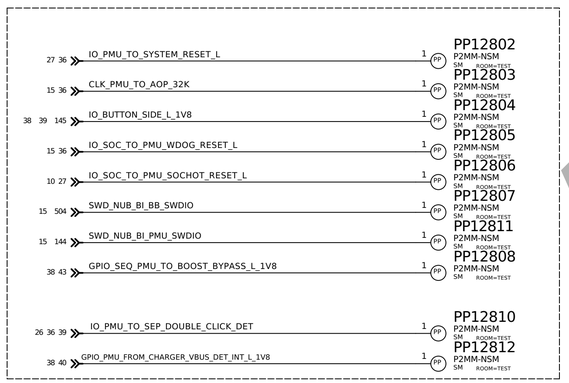
CHROMITE


144 GPIO_SPARE_WLCHGR_SUPER_PP 1 PP12878 P2MM-NSM SM ROOM=CHROMITE
44 I2C_SDA_WLCHGR 1 PP12879 P2MM-NSM SM ROOM=CHROMITE
44 I2C_SCL_WLCHGR 1 PP12880 P2MM-NSM SM ROOM=CHROMITE
44 IO_WLCHGR_INT 1 PP12881 P2MM-NSM SM ROOM=CHROMITE
15 144 SWD_NUB_BI_WLCHGR_SWDIO 1 PP12883 P2MM-NSM SM ROOM=CHROMITE
44 WLCHGR_AMUX0 1 PP12884 P2MM-NSM SM ROOM=CHROMITE
44 WLCHGR_AMUX1 1 PP12885 P2MM-NSM SM ROOM=CHROMITE

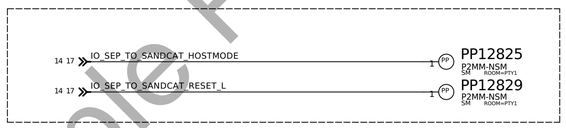
ARUE



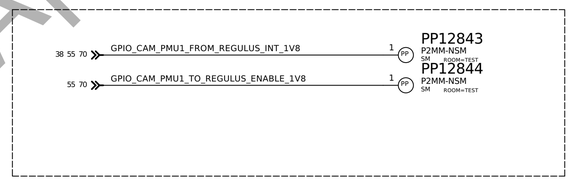
PMU


27 36 IO_PMU_TO_SYSTEM_RESET_L 1 PP12802 P2MM-NSM SM ROOM=TEST
15 36 CLK_PMU_TO_AOP_32K 1 PP12803 P2MM-NSM SM ROOM=TEST
38 39 145 IO_BUTTON_SIDE_L_1V8 1 PP12804 P2MM-NSM SM ROOM=TEST
15 36 IO_SOC_TO_PMU_WDOG_RESET_L 1 PP12805 P2MM-NSM SM ROOM=TEST
10 27 IO_SOC_TO_PMU_SOCHOT_RESET_L 1 PP12806 P2MM-NSM SM ROOM=TEST
15 504 SWD_NUB_BI_BB_SWDIO 1 PP12807 P2MM-NSM SM ROOM=TEST
15 144 SWD_NUB_BI_PMU_SWDIO 1 PP12811 P2MM-NSM SM ROOM=TEST
38 43 GPIO_SEQ_PMU_TO_BOOST_BYPASS_L_1V8 1 PP12808 P2MM-NSM SM ROOM=TEST
26 36 39 IO_PMU_TO_SEP_DOUBLE_CLICK_DET 1 PP12810 P2MM-NSM SM ROOM=TEST
38 40 GPIO_PMU_FROM_CHARGER_VBUS_DET_INT_L_1V8 1 PP12812 P2MM-NSM SM ROOM=TEST

SANDCAT


14 17 IO_SEP_TO_SANDCAT_HOSTMODE 1 PP12825 P2MM-NSM SM ROOM=PTY1
14 17 IO_SEP_TO_SANDCAT_RESET_L 1 PP12829 P2MM-NSM SM ROOM=PTY1

Alda


38 55 70 GPIO_CAM_PMU1_FROM_REGULUS_INT_1V8 1 PP12843 P2MM-NSM SM ROOM=TEST
55 70 GPIO_CAM_PMU1_TO_REGULUS_ENABLE_1V8 1 PP12844 P2MM-NSM SM ROOM=TEST

Apple Proprietary and Confidential

PAGE TITLE

TESTING: Probe Points (128)

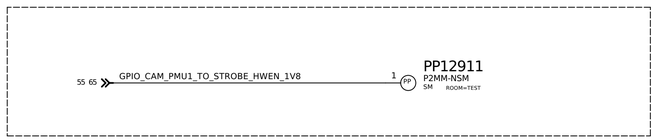
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

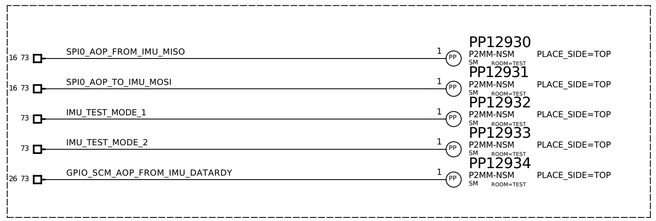
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Probe Points

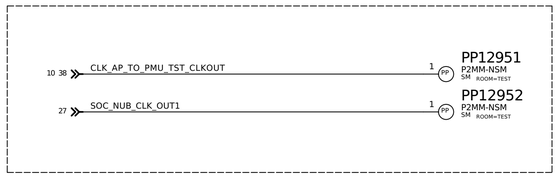
CAM + STROBE



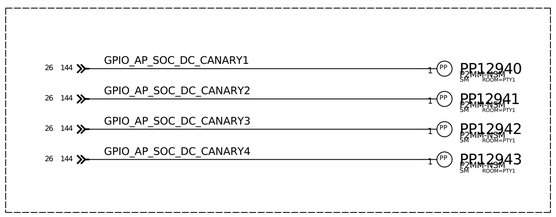
IMU



SOC



SOC CANARY



Apple Proprietary and Confidential

PAGE TITLE

TESTING: Probe Points (FF Specific) (129)

Apple Inc.

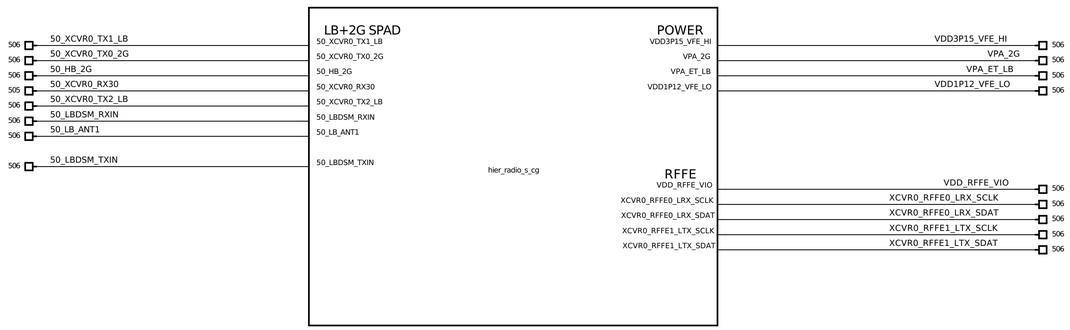
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

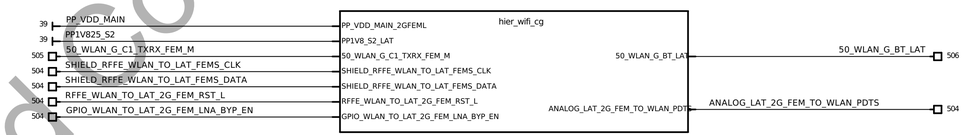
HIERARCHY BLOCKS

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00308	132S00264	C1315_C	CAP,X5R,2200PF,10%,16V,KYO,01005
132S0420	132S00264	C1315_C	CAP,CER,X5R,2200PF,10%,16V,01005

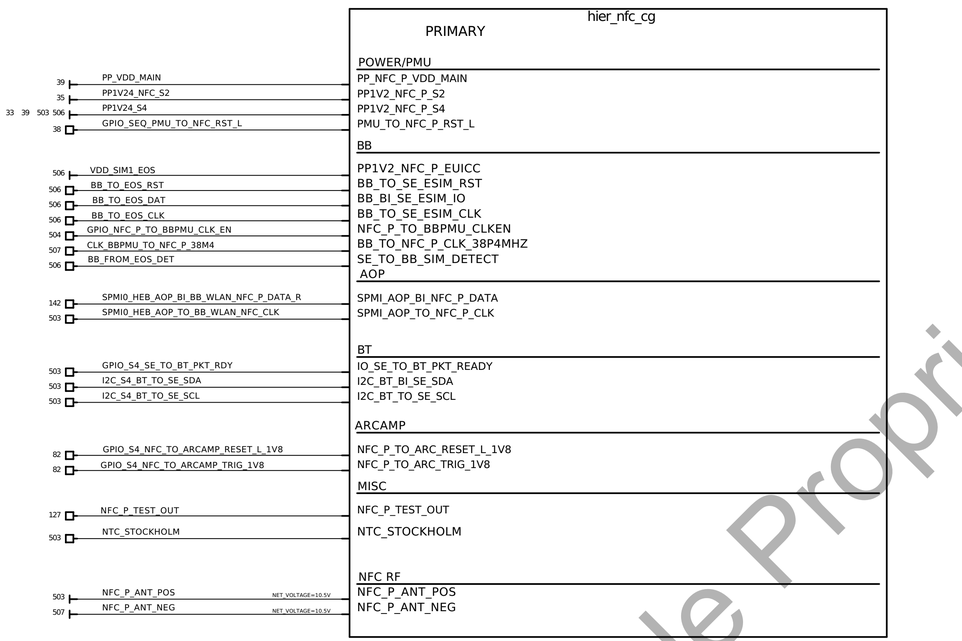
HIER_RADIO

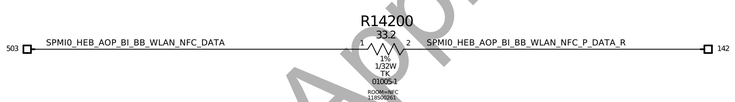


HIER_WIFI



HIER_NFC





Apple Proprietary and Confidential

PAGE TITLE

HIERARCHIES: TOP (142)

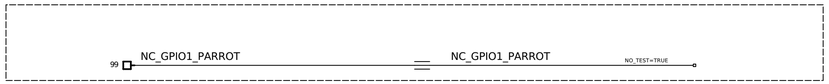
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

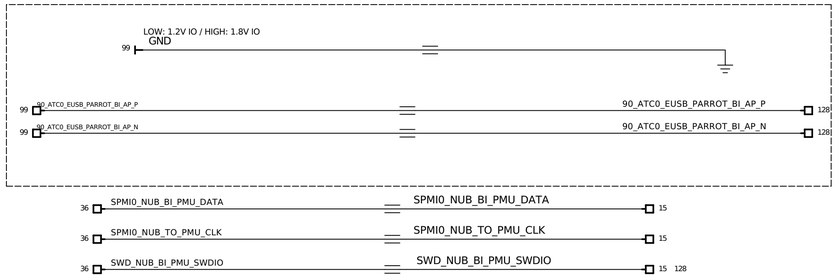
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

GENERAL ALIASES

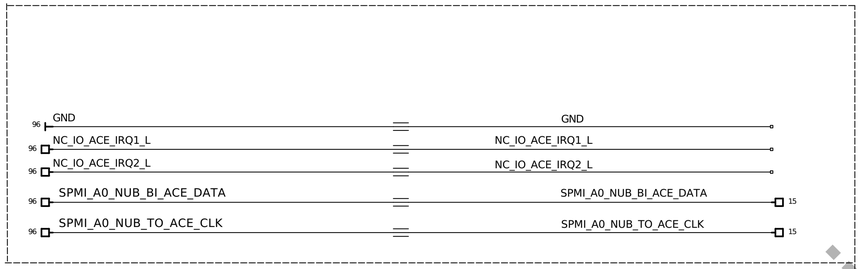
ACE3LITE



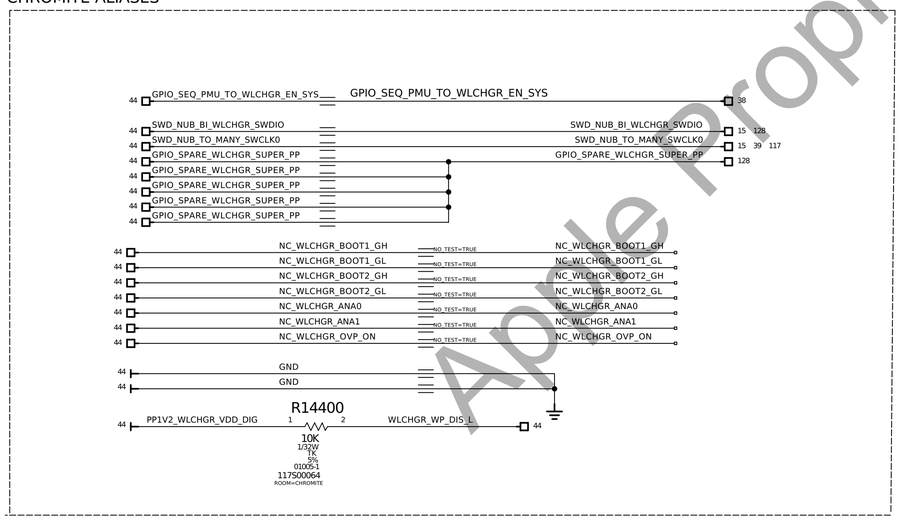
eUSB (PARROT)



ACE3L

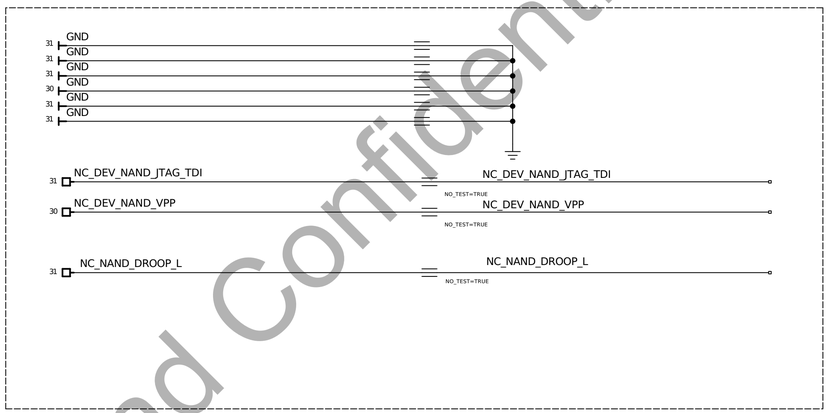


CHROMITE ALIASES

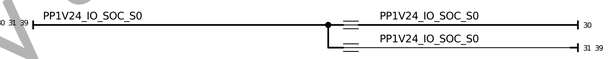


NAND ALIASES

DEV BOARD COMPATIBILITY



VDDIO2



Apple Proprietary and Confidential

PAGE TITLE
SYSTEM: General Aliases (144)

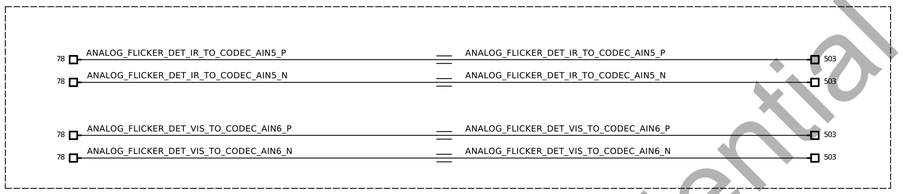
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

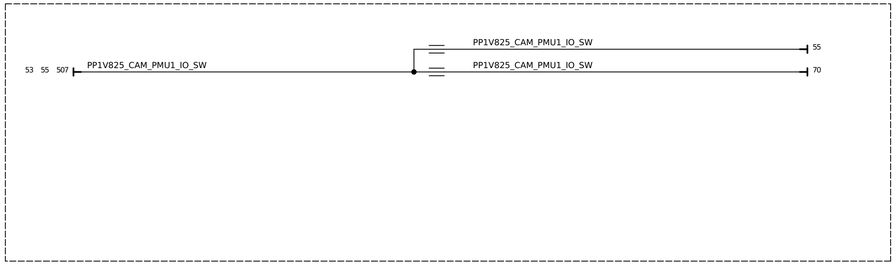
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FF SPECIFIC ALIASES

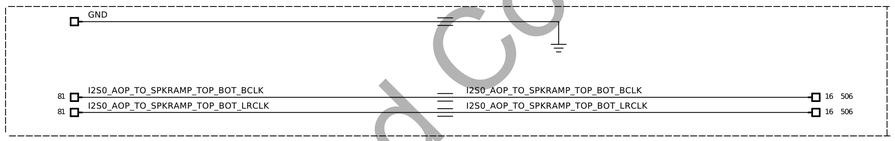
GRIMALDI



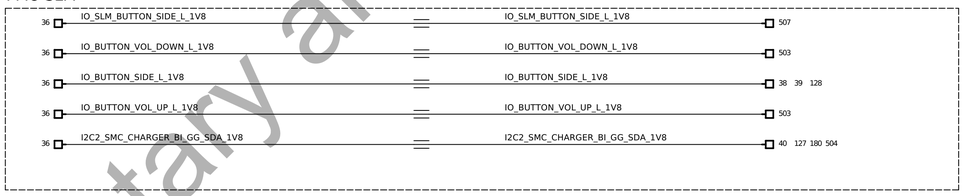
CAMERAS (DEV COMPATIBILITY)



MISC



PMU SLM



Apple Proprietary and Confidential

PAGE TITLE

SYSTEM: FF Specific Aliases (145)

Apple Inc.

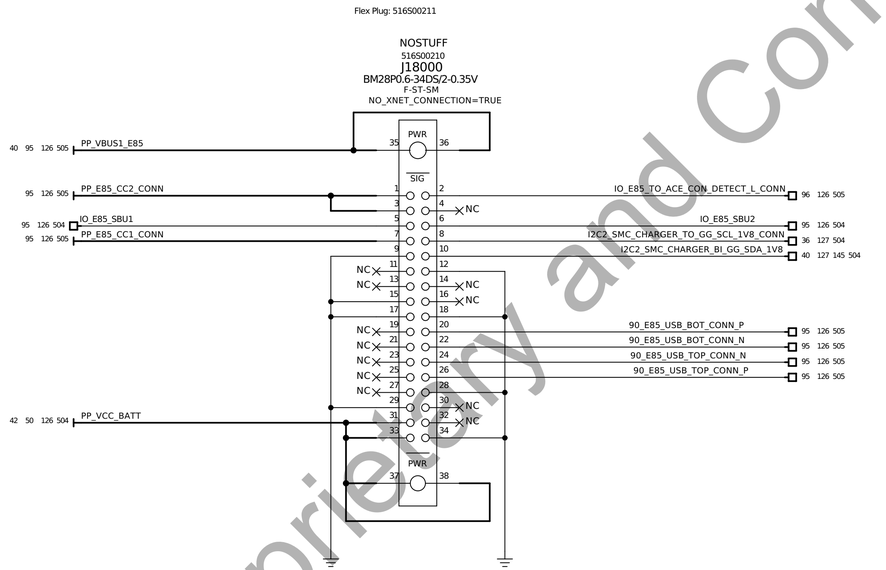
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

DEBUG CONNECTORS

Dock Jumper B2B

Battery B2B



Apple Proprietary and Confidential

PAGE TITLE

DEBUG: E85 + Battery B2B (180)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

998-33263

J_INT_CG

INTERPOSER-BOT-CG-V59

SMT-PAD

SYM 1 OF 5

OMIT

503	GND	1	IO1	IO91	91	NTC_RADIO_PA_P	503
503	GND	2	IO2	IO92	92	GND	503
503	GND	3	IO3	IO93	93	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_N	503
503	GND	4	IO4	IO94	94	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_P	503
503	PP1V17_FCAM_DVDD	5	IO5	IO95	95	GND	503
503	CLK_CAM_PMU1_TO_FCAM_12M_1V8	6	IO6	IO96	96	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_N	503
503	GND	7	IO7	IO97	97	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_P	503
503	GND	8	IO8	IO98	98	GND	503
503	GND	9	IO9	IO99	99	ANALOG_MIC2_REAR_TO_CODEC_AIN2_P	503
503	GND	10	IO10	IO100	100	ANALOG_MIC2_REAR_TO_CODEC_AIN2_N	503
503	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_P	11	IO11	IO101	101	GND	503
503	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_N	12	IO12	IO102	102	PP_CODEC_TO_MIC2_REAR_BIAS	503
503	GND	13	IO13	IO103	103	RET_CODEC_FROM_MIC2_REAR	503
503	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_N	14	IO14	IO104	104	GND	503
503	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_P	15	IO15	IO105	105	GND	503
503	GND	16	IO16	IO106	106	GND	503
503	GND	17	IO17	IO107	107	GND	503
503	GND	18	IO18	IO108	108	PP_STROBE_DRIVER_CENTER_LED	503
503	GND	19	IO19	IO109	109	PP_STROBE_DRIVER_CENTER_LED	503
503	COIL_TO_SPKRAMP_TOP_VSENSE_POS_CONN	20	IO20	IO110	110	GND	503
503	COIL_TO_SPKRAMP_TOP_VSENSE_NEG_CONN	21	IO21	IO111	111	I2C3_AOP_SDA	503
503	GND	22	IO22	IO112	112	I2C3_AOP_SCL	503
503	SPKRAMP_TOP_TO_COIL_OUT_NEG	23	IO23	IO113	113	GND	503
503	SPKRAMP_TOP_TO_COIL_OUT_POS	24	IO24	IO114	114	PP1V825_S2	503
503	GND	25	IO25	IO115	115	PP3V0_FLICKER_DET_VDD_S0	503
503	GND	26	IO26	IO116	116	GND	503
503	GND	27	IO27	IO117	117	PCIE_GP0_AP_BI_WLAN_CLKREQ_L	503
503	GND	28	IO28	IO118	118	NTC_STROBE_MODULE	503
503	NFC_P_ANT_POS	29	IO29	IO119	119	GND	503
503	NFC_P_ANT_POS	30	IO30	IO120	120	GND	503
503	GND	31	IO31	IO121	121	GND	503
503	NFC_P_ANT_POS	32	IO32	IO122	122	GND	503
503	GND	33	IO33	IO123	123	PAC_WLCHGR_COIL1	503
503	GND	34	IO34	IO124	124	PAC_WLCHGR_COIL1	503
503	GND	35	IO35	IO125	125	GND	503
503	GND	36	IO36	IO126	126	PAC_WLCHGR_COIL2	503
503	GND	37	IO37	IO127	127	PAC_WLCHGR_COIL2	503
503	GND	38	IO38	IO128	128	GND	503
503	GND	39	IO39	IO129	129	GND	503
503	GND	40	IO40	IO130	130	GND	503
503	GND	41	IO41	IO131	131	GND	503
503	GND	42	IO42	IO132	132	90_PCIE_GP0_AP_TO_WLAN_TX_P	503
503	GND	43	IO43	IO133	133	90_PCIE_GP0_AP_TO_WLAN_TX_N	503
503	GND	44	IO44	IO134	134	GND	503
503	GND	45	IO45	IO135	135	90_PCIE_GP0_AP_FROM_WLAN_RX_N	503
503	GND	46	IO46	IO136	136	90_PCIE_GP0_AP_FROM_WLAN_RX_P	503
503	GND	47	IO47	IO137	137	GND	503
503	GND	48	IO48	IO138	138	90_PCIE_GP0_AP_TO_WLAN_REFCLK_P	503
503	GND	49	IO49	IO139	139	90_PCIE_GP0_AP_TO_WLAN_REFCLK_N	503
503	GND	50	IO50	IO140	140	GND	503
503	GND	51	IO51	IO141	141	GND	503
503	GND	52	IO52	IO142	142	GND	503
503	GND	53	IO53	IO143	143	GND	503
503	GND	54	IO54	IO144	144	SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA	503
503	GND	55	IO55	IO145	145	SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK	503
503	GND	56	IO56	IO146	146	GND	503
503	GND	57	IO57	IO147	147	PCIE_GP0_AP_TO_WLAN_PERST_L	503
503	GND	58	IO58	IO148	148	GPIO_AP_FROM_WLAN_TIME_SYNC	503
503	GND	59	IO59	IO149	149	GND	503
503	NTC_STOCKHOLM	60	IO60	IO150	150	CLK_GPIO_S4_PMU_TO_WLAN_32K	503
503	PP1V998_FCAM_VDDAF	61	IO61	IO151	151	GPIO_PMU_FROM_WLAN_HOST_WAKE	503
503	GND	62	IO62	IO152	152	SPMI1_COEX_AOP_TO_BB_WLAN_CLK	503
503	GPIO_AP_INTERPOSER_CANARY6_B_TO_C	63	IO63	IO153	153	GND	503
503	GND	64	IO64	IO154	154	GND	503
503	GND	65	IO65	IO155	155	GPIO_S4_SE_TO_BT_PKT_RDY	503
503	GND	66	IO66	IO156	156	SPMI1_COEX_AOP_BI_BB_WLAN_DATA	503
503	GND	67	IO67	IO157	157	GPIO_AP_INTERPOSER_CANARY7_B_TO_C	503
503	GPIO_AP_INTERPOSER_CANARY6_B_TO_C	68	IO68	IO158	158	I2C_S4_BT_TO_SE_SCL	503
503	GND	69	IO69	IO159	159	GND	503
503	GND	70	IO70	IO160	160	GND	503
503	GND	71	IO71	IO161	161	I2C_S4_BT_TO_SE_SDA	503
503	PP1V24_S4	72	IO72	IO162	162	GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON	503
503	PP1V825_S4	73	IO73	IO163	163	PP_VDD_MAIN	503
503	GND	74	IO74	IO164	164	GND	503
503	GND	75	IO75	IO165	165	GPIO_AP_FROM_BT_AUDIO_SYNC	503
503	PP_VDD_MAIN	76	IO76	IO166	166	PP_VDD_MAIN	503
503	GND	77	IO77	IO167	167	GPIO_AP_INTERPOSER_CANARY7_B_TO_C	503
503	GND	78	IO78	IO168	168	GND	503
503	GND	79	IO79	IO169	169	GND	503
503	GND	80	IO80	IO170	170	GND	503
503	GND	81	IO81	IO171	171	GPIO_NUB_TO_BB_DEBUG_EN	503
503	GND	82	IO82	IO172	172	GPIO_NUB_FROM_BB_WDOG_L	503
503	GND	83	IO83	IO173	173	GND	503
503	IO_BUTTON_RINGER_L	84	IO84	IO174	174	GPIO_SEQ_PMU_TO_BBPMU_RESET_L	503
503	IO_BUTTON_VOL_UP_L_1V8	85	IO85	IO175	175	GPIO_PMU_FROM_BB_PCIE_HOST_WAKE_L	503
503	GPIO_AP_INTERPOSER_CANARY6_AP_TO_A	86	IO86	IO176	176	GPIO_AP_INTERPOSER_CANARY7_AP_TO_A	503
503	IO_BUTTON_VOL_DOWN_L_1V8	87	IO87	IO177	177	PCIE_GP1_AP_TO_BB_PERST_L	503
503	GND	88	IO88	IO178	178	GND	503
503	GND	89	IO89	IO179	179	PCIE_GP1_AP_BI_BB_CLKREQ_L	503
503	GND	90	IO90	IO180	180	GND	503

998-33263

J_INT_CG

INTERPOSER-BOT-CG-V59

SMT-PAD

SYM 2 OF 5

OMIT

504	GND	181	IO181	IO271	271	GND	504
504	GND	182	IO182	IO272	272	PP_VCC_BATT	504
504	GND	183	IO183	IO273	273	PP_VCC_BATT	504
504	GND	184	IO184	IO274	274	GND	504
504	SWD_NUB_BI_BB_SWDIO	185	IO185	IO275	275	PP_VCC_BATT	504
504	GND	186	IO186	IO276	276	PP_VCC_BATT	504
504	SWD_NUB_TO_BB_SWCLK	187	IO187	IO277	277	GND	504
504	GND	188	IO188	IO278	278	PP_VCC_BATT	504
504	GND	189	IO189	IO279	279	PP_VCC_BATT	504
504	GND	190	IO190	IO280	280	GND	504
504	90_PCIE_GP1_AP_TO_BB_REFCLK_N	191	IO191	IO281	281	PP_VCC_BATT	504
504	GND	192	IO192	IO282	282	PP_VCC_BATT	504
504	90_PCIE_GP1_AP_TO_BB_REFCLK_P	193	IO193	IO283	283	GND	504
504	GND	194	IO194	IO284	284	PP_VCC_BATT	504
504	90_PCIE_GP1_AP_TO_BB_TX_P	195	IO195	IO285	285	GND	504
504	GND	196	IO196	IO286	286	GND	504
504	90_PCIE_GP1_AP_TO_BB_TX_N	197	IO197	IO287	287	GND	504
504	GND	198	IO198	IO288	288	ANALOG_LAT_2G_FEM_TO_WLAN_PDTS	504
504	90_PCIE_GP1_AP_FROM_BB_RX_N	199	IO199	IO289	289	GND	504
504	GND	200	IO200	IO290	290	GND	504
504	90_PCIE_GP1_AP_FROM_BB_RX_P	201	IO201	IO291	291	RFFE_WLAN_TO_LAT_2G_FEM_RST_L	504
504	GND	202	IO202	IO292	292	GND	504
504	GND	203	IO203	IO293	293	GND	504
504	GND	204	IO204	IO294	294	GND	504
504	90_EUSB_BB_DBG_N	205	IO205	IO295	295	GND	504
504	GND	206	IO206	IO296	296	GPIO_AP_INTERPOSER_CANARY9_B_TO_C	504
504	90_EUSB_BB_DBG_P	207	IO207	IO297	297	GPIO_AP_INTERPOSER_CANARY9_AP_TO_A	504
504	GND	208	IO208	IO298	298	GND	504
504	GND	209	IO209	IO299	299	GND	504
504	GND	210	IO210	IO300	300	GND	504
504	GND	211	IO211	IO301	301	GPIO_AP_INTERPOSER_CANARY9_B_TO_C	504
504	GND	212	IO212	IO302	302	GND	504
504	PP_VDD_MAIN	213	IO213	IO303	303	GND	504
504	GND	214	IO214	IO304	304	GND	504
504	PP_VDD_MAIN	215	IO215	IO305	305	GPIO_AP_INTERPOSER_CANARY9_D_TO_E	504
504	GND	216	IO216	IO306	306	GND	504
504	PP_VDD_MAIN	217	IO217	IO307	307	GND	504
504	GND	218	IO218	IO308	308	GND	504
504	PP_VDD_MAIN	219	IO219	IO309	309	GPIO_AP_INTERPOSER_CANARY9_D_TO_E	504
504	GND	220	IO220	IO310	310	GND	504
504	PP_VDD_MAIN	221	IO221	IO311	311	GND	504
504	GND	222	IO222	IO312	312	GND	504
504	GND	223	IO223	IO313	313	IO_E85_LDCM	504
504	GND	224	IO224	IO314	314	GND	504
504	GND	225	IO225	IO315	315	GND	504
504	GND	226	IO226	IO316	316	IO_E85_LDCM_LB	504
504	PP1V825_S4	227	IO227	IO317	317	GND	504
504	GND	228	IO228	IO318	318	GND	504
504	IO_TOUCH_TO_MANY_SCAN_ACTIVE	229	IO229	IO319	319	IO_E85_SBU2	504
504	GND	230	IO230	IO320	320	GND	504
504	GPIO_NUB_TO_BB_FORCE_PWM	231	IO231	IO321	321	GND	504
504	GND	232	IO232	IO322	322	IO_E85_SBU1	504
504	GND	233	IO233	IO323	323	GND	504
504	GND	234	IO234	IO324	324	PP1V24_S2	504
504	CLK_GPIO_S2_APPMU_TO_BBPMU_32K_1V8	235	IO235	IO325	325	GND	504
504	GND	236	IO236	IO326	326	GPIO_WLAN_TO_LAT_2G_FEM_LNA_BYP_EN	504
504	GND	237	IO237	IO327	327	GND	504
504	GND	238	IO238	IO328	328	GND	504
504	GPIO_NFC_P_TO_BBPMU_CLK_EN	239	IO239	IO329	329	GND	504
504	GND	240	IO240	IO330	330	GND	504
504	NTC_RADIO_BB_P	241	IO241	IO331	331	GND	504
504	GND	242	IO242	IO332	332	GND	504
504	PP1V825_S2	243	IO243	IO333	333	GND	504
504	GND	244	IO244	IO334	334	GND	504
504	GPIO_AP_INTERPOSER_CANARY8_AP_TO_A	245	IO245	IO335	335	GND	504
504	GND	246	IO246	IO336	336	GND	504
504	GND	247	IO247	IO337	337	GND	504
504	GND	248	IO248	IO338	338	GND	504
504	GND	249	IO249	IO339	339	GND	504
504	GPIO_AP_INTERPOSER_CANARY8_B_TO_C	250	IO250	IO340	340	GND	504
504	SHIELD_RFFE_WLAN_TO_LAT_FEMS_CLK	251	IO251	IO341	341	GND	504
504	SHIELD_RFFE_WLAN_TO_LAT_FEMS_DATA	252	IO252	IO342	342	GND	504
504	GND	253	IO253	IO343	343	GND	504
504	GPIO_AOP_FROM_GNSS_HOST_REQ	254	IO254	IO344	344	GND	504
504	GND	255	IO255	IO345	345	GND	504
504	GND	256	IO256	IO346	346	GND	504
504	GPIO_SCM_AOP_TO_GNSS_SPI_CS_L	257	IO257	IO347	347	GND	504
504	SPI1_AOP_TO_GNSS_SCLK	258	IO258	IO348	348	GND	504
504	GPIO_AP_INTERPOSER_CANARY8_B_TO_C	259	IO259	IO349	349	GND	504
504	SPI1_AOP_FROM_GNSS_MISO	260	IO260	IO350	350	GND	504
504	SPI1_AOP_TO_GNSS_MOSI	261	IO261	IO351	351	GND	504
504	GND	262	IO262	IO352	352	GND	504
504	GND	263	IO263	IO353	353	PPVAR_BARO_S2	504
504	GND	264	IO264	IO354	354	GND	504
504	GND	265	IO265	IO355	355	ANALOG_MIC1_LOWER_TO_CODEC_AIN1_P	504
504	I2C2_SMC_CHARGER_TO_GG_SCL_1V8_CONN	266	IO266	IO356	356	GND	504
504	I2C2_SMC_CHARGER_BI_GG_SDA_1V8	267	IO267	IO357	357	ANALOG_MIC1_LOWER_TO_CODEC_AIN1_N	504
504	GND	268	IO268	IO358	358	GND	504
504	GND	269	IO269	IO359	359	RET_CODEC_FROM_MIC1_LOWER	504
504	GND	270	IO270	IO360	360	GND	504

Apple Proprietary and Confidential

PAGE TITLE

Interposer: CG (1/3) (500)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

998-33263

J_INT_CG

INTERPOSER-BOT-CG-V59

SMT-PAD

SYM 3 OF 5

505	PP_CODEC_TO_MIC1_LOWER_BIAS	361	IO361	IO451	451	GND	505
505	GND	362	IO362	IO452	452	GND	505
505	GND	363	IO363	IO453	453	GND	505
505	GND	364	IO364	IO454	454	GND	505
505	90_E85_USB_BOT_CONN_P	365	IO365	IO455	455	GND	505
505	GND	366	IO366	IO456	456	GND	505
505	90_E85_USB_BOT_CONN_N	367	IO367	IO457	457	GND	505
505	GND	368	IO368	IO458	458	GND	505
505	90_E85_USB_TOP_CONN_N	369	IO369	IO459	459	GND	505
505	GND	370	IO370	IO460	460	GND	505
505	90_E85_USB_TOP_CONN_P	371	IO371	IO461	461	GND	505
505	GND	372	IO372	IO462	462	GND	505
505	GND	373	IO373	IO463	463	GND	505
505	GND	374	IO374	IO464	464	GND	505
505	GND	375	IO375	IO465	465	50_WLAN_G_C1_TXRX_FEM_M	505
505	GND	376	IO376	IO466	466	GND	505
505	GND	377	IO377	IO467	467	GND	505
505	PP_E85_CC1_CONN	378	IO378	IO468	468	GND	505
505	GND	379	IO379	IO469	469	50_XCVR0_RX30	505
505	PP_E85_CC2_CONN	380	IO380	IO470	470	GND	505
505	GND	381	IO381	IO471	471	GND	505
505	GND	382	IO382	IO472	472	GND	505
505	GND	383	IO383	IO473	473	GND	505
505	IO_E85_TO_ACE_CON_DETECT_L_CONN	384	IO384	IO474	474	GND	505
505	GND	385	IO385	IO475	475	GND	505
505	GPIO_AOP_FROM_BARO_INT_L	386	IO386	IO476	476	GND	505
505	GND	387	IO387	IO477	477	GND	505
505	I2C1_AOP_SCL	388	IO388	IO478	478	GND	505
505	GND	389	IO389	IO479	479	GND	505
505	I2C1_AOP_SDA	390	IO390	IO480	480	GND	505
505	GND	391	IO391	IO481	481	GND	505
505	GND	392	IO392	IO482	482	GND	505
505	GND	393	IO393	IO483	483	GND	505
505	GND	394	IO394	IO484	484	GND	505
505	GND	395	IO395	IO485	485	GND	505
505	PP_VBUS1_E85	396	IO396	IO486	486	GND	505
505	PP_VBUS1_E85	397	IO397	IO487	487	GND	505
505	GND	398	IO398	IO488	488	GND	505
505	PP_VBUS1_E85	399	IO399	IO489	489	GND	505
505	PP_VBUS1_E85	400	IO400	IO490	490	GND	505
505	GND	401	IO401	IO491	491	GND	505
505	PP_VBUS1_E85	402	IO402	IO492	492	GND	505
505	PP_VBUS1_E85	403	IO403	IO493	493	GND	505
505	GND	404	IO404	IO494	494	GND	505
505	GND	405	IO405	IO495	495	GND	505
505	GND	406	IO406	IO496	496	GND	505
505	GND	407	IO407	IO497	497	GND	505
505	GND	408	IO408	IO498	498	GND	505
505	GND	409	IO409	IO499	499	GND	505
505	GND	410	IO410	IO500	500	GND	505
505	GND	411	IO411	IO501	501	GND	505
505	GND	412	IO412	IO502	502	GND	505
505	GND	413	IO413	IO503	503	GND	505
505	GND	414	IO414	IO504	504	GND	505
505	GND	415	IO415	IO505	505	GND	505
505	GND	416	IO416	IO506	506	GND	505
505	GND	417	IO417	IO507	507	GND	505
505	GND	418	IO418	IO508	508	GND	505
505	GND	419	IO419	IO509	509	GND	505
505	GND	420	IO420	IO510	510	GND	505
505	GPIO_AP_INTERPOSER_CANARY10_AP_TO_A	421	IO421	IO511	511	GND	505
505	GND	422	IO422	IO512	512	GND	505
505	GND	423	IO423	IO513	513	GND	505
505	GND	424	IO424	IO514	514	GND	505
505	GND	425	IO425	IO515	515	GND	505
505	GND	426	IO426	IO516	516	GND	505
505	GND	427	IO427	IO517	517	GND	505
505	RET_CODEC_FROM_MIC4_LOWER	428	IO428	IO518	518	GND	505
505	GPIO_AP_INTERPOSER_CANARY10_B_TO_C	429	IO429	IO519	519	GND	505
505	PP_CODEC_TO_MIC4_LOWER_BIAS	430	IO430	IO520	520	GND	505
505	GND	431	IO431	IO521	521	GND	505
505	ANALOG_MIC4_LOWER_TO_CODEC_AIN4_N	432	IO432	IO522	522	GND	505
505	GND	433	IO433	IO523	523	GND	505
505	ANALOG_MIC4_LOWER_TO_CODEC_AIN4_P	434	IO434	IO524	524	GND	505
505	GND	435	IO435	IO525	525	GND	505
505	GND	436	IO436	IO526	526	GND	505
505	GPIO_AP_INTERPOSER_CANARY10_B_TO_C	437	IO437	IO527	527	GND	505
505	GPIO_S4_PMU_TO_SPKRAMP_BOT_RESET_L	438	IO438	IO528	528	GND	505
505	GND	439	IO439	IO529	529	GND	505
505	IO_SPKRAMP_TO_SPKRAMP_SYNC	440	IO440	IO530	530	GND	505
505	GND	441	IO441	IO531	531	GND	505
505	GPIO_S4_PMU_NFC_TO_ARCAMP_RESET_L_1V8	442	IO442	IO532	532	GND	505
505	GND	443	IO443	IO533	533	GND	505
505	GPIO_S4_PMU_NFC_TO_ARCAMP_TRIG_1V8	444	IO444	IO534	534	GND	505
505	GND	445	IO445	IO535	535	GND	505
505	GND	446	IO446	IO536	536	GND	505
505	GND	447	IO447	IO537	537	GND	505
505	I2S0_AOP_TO_SPKRAMP_TOP_BOT_ARCAMP_MCLK	448	IO448	IO538	538	GND	505
505	GND	449	IO449	IO539	539	GND	505
505	GND	450	IO450	IO540	540	GND	505

OMIT

998-33263

J_INT_CG

INTERPOSER-BOT-CG-V59

SMT-PAD

SYM 4 OF 5

506	GND	541	IO541	IO631	631	PP_VDD_MAIN	506
506	GND	542	IO542	IO632	632	PP_VDD_MAIN	506
506	GND	543	IO543	IO633	633	PP_VDD_MAIN	506
506	GND	544	IO544	IO634	634	GND	506
506	GND	545	IO545	IO635	635	GND	506
506	GND	546	IO546	IO636	636	XCVR0_RFFE1_LTX_SDAT	506
506	GND	547	IO547	IO637	637	XCVR0_RFFE1_LTX_SCLK	506
506	GND	548	IO548	IO638	638	GND	506
506	GND	549	IO549	IO639	639	GND	506
506	GND	550	IO550	IO640	640	VPA_ET_LB	506
506	GND	551	IO551	IO641	641	VPA_ET_LB	506
506	GND	552	IO552	IO642	642	GND	506
506	GND	553	IO553	IO643	643	GND	506
506	GND	554	IO554	IO644	644	VPA_2G	506
506	GND	555	IO555	IO645	645	VPA_2G	506
506	GND	556	IO556	IO646	646	GND	506
506	GND	557	IO557	IO647	647	GND	506
506	GND	558	IO558	IO648	648	GND	506
506	GND	559	IO559	IO649	649	GND	506
506	GND	560	IO560	IO650	650	VDD3P15_VFE_HI	506
506	GND	561	IO561	IO651	651	GND	506
506	GND	562	IO562	IO652	652	GND	506
506	50_WLAN_G_BT_LAT	563	IO563	IO653	653	GND	506
506	GND	564	IO564	IO654	654	GPIO_AP_INTERPOSER_CANARY11_D_TO_E	506
506	GND	565	IO565	IO655	655	GND	506
506	GND	566	IO566	IO656	656	GPIO_AP_INTERPOSER_CANARY11_D_TO_E	506
506	VDD_SIM1_EOS	567	IO567	IO657	657	GND	506
506	BB_TO_EOS_CLK	568	IO568	IO658	658	GPIO_AP_INTERPOSER_CANARY11_B_TO_C	506
506	GND	569	IO569	IO659	659	GND	506
506	BB_TO_EOS_DAT	570	IO570	IO660	660	GPIO_AP_INTERPOSER_CANARY11_B_TO_C	506
506	BB_TO_EOS_RST	571	IO571	IO661	661	GND	506
506	BB_FROM_EOS_DET	572	IO572	IO662	662	GPIO_AP_INTERPOSER_CANARY11_AP_TO_A	506
506	PP1V825_S2	573	IO573	IO663	663	GND	506
506	PP1V24_S4	574	IO574	IO664	664	GND	506
506	GND	575	IO575	IO665	665	GND	506
506	PP1V825_S4	576	IO576	IO666	666	GND	506
506	GND	577	IO577	IO667	667	GND	506
506	50_LB_ANT1	578	IO578	IO668	668	GND	506
506	GND	579	IO579	IO669	669	GND	506
506	GND	580	IO580	IO670	670	GND	506
506	GND	581	IO581	IO671	671	GND	506
506	I2C2_AOP_SDA	582	IO582	IO672	672	GND	506
506	I2S0_AOP_TO_SPKRAMP_TOP_BOT_LRCLK	583	IO583	IO673	673	GND	506
506	I2S0_AOP_FROM_SPKRAMP_TOP_BOT_DIN	584	IO584	IO674	674	GND	506
506	I2S0_AOP_TO_SPKRAMP_TOP_BOT_BCLK	585	IO585	IO675	675	GND	506
506	I2S3_AOP_TO_ARCAMP_CODEC_ASP3_BCLK	586	IO586	IO676	676	GND	506
506	I2S3_AOP_FROM_ARCAMP_CODEC_ASP3_DIN	587	IO587	IO677	677	GND	506
506	I2C2_AOP_SCL	588	IO588	IO678	678	PP1V24_S4	506
506	I2S3_AOP_TO_ARCAMP_CODEC_ASP3_LRCLK	589	IO589	IO679	679	GND	506
506	GND	590	IO590	IO680	680	90_LPDP_ISP_FROM_WIDE_RX_D0_CONN_P	506
506	GND	591	IO591	IO681	681	GND	506
506	GND	592	IO592	IO682	682	GPIO_BB_TO_NUB_GSM_TXBURST_IND	506
506	50_HB_2G	593	IO593	IO683	683	GND	506
506	I2S3_AOP_TO_ARCAMP_CODEC_ASP3_DOUT	594	IO594	IO684	684	90_LPDP_ISP_FROM_WIDE_RX_D0_CONN_N	506
506	GND	595	IO595	IO685	685	GND	506
506	GND	596	IO596	IO686	686	GPIO_CAM_PMU1_TO_WIDE_SHDN_L_1V8	506
506	GND	597	IO597	IO687	687	GND	506
506	GND	598	IO598	IO688	688	90_LPDP_ISP_FROM_WIDE_RX_D1_CONN_P	506
506	PP_VDD_MAIN	599	IO599	IO689	689	GND	506
506	PP_VDD_MAIN	600	IO600	IO690	690	I2C1_CAM_PMU1_SCL_1V8	506
506	PP_VDD_MAIN	601	IO601	IO691	691	GND	506
506	PP_VDD_MAIN	602	IO602	IO692	692	90_LPDP_ISP_FROM_WIDE_RX_D1_CONN_N	506
506	GND	603	IO603	IO693	693	GND	506
506	GND	604	IO604	IO694	694	I2C1_CAM_PMU1_SDA_1V8	506
506	I2S0_AOP_TO_SPKRAMP_TOP_BOT_DOUT	605	IO605	IO695	695	GND	506
506	GND	606	IO606	IO696	696	90_LPDP_ISP_FROM_WIDE_RX_D2_CONN_P	506
506	GND	607	IO607	IO697	697	GND	506
506	GND	608	IO608	IO698	698	PP1V13_WIDE_DVDD	506
506	GND	609	IO609	IO699	699	GND	506
506	GND	610	IO610	IO700	700	90_LPDP_ISP_FROM_WIDE_RX_D2_CONN_N	506
506	50_LBDSM_TXIN	611	IO611	IO701	701	GND	506
506	GND	612	IO612	IO702	702	GND	506
506	GND	613	IO613	IO703	703	GND	506
506	50_LBDSM_RXIN	614	IO614	IO704	704	GND	506
506	GND	615	IO615	IO705	705	GND	506
506	GND	616	IO616	IO706	706	PPVAR_RCAM_PVDD	506
506	VDD_RFFE_VIO	617	IO617	IO707	707	GND	506
506	VDD1P12_VFE_LO	618	IO618	IO708	708	GND	506
506	XCVR0_RFFE0_LRX_SCLK	619	IO619	IO709	709	GND	506
506	XCVR0_RFFE0_LRX_SDAT	620	IO620	IO710	710	GND	506
506	GND	621	IO621	IO711	711	CLK_CAM_PMU1_TO_WIDE_24M_1V8	506
506	GND	622	IO622	IO712	712	GND	506
506	GND	623	IO623	IO713	713	GND	506
506	50_XCVR0_TX1_LB	624	IO624	IO714	714	PP1V8_RCAM_VDDIO	506
506	GND	625	IO625	IO715	715	GND	506
506	50_XCVR0_TX0_2G	626	IO626	IO716	716	90_MIPI_ISP_FROM_IRCAM_D0_P	506
506	GND	627	IO627	IO717	717	GND	506
506	50_XCVR0_TX2_LB	628	IO628	IO718	718	PPVAR_WIDE_AVDD2	506
506	GND	629	IO629	IO719	719	GND	506
506	GND	630	IO630	IO720	720	90_MIPI_ISP_FROM_IRCAM_D0_N	506

OMIT

Apple Confidential
Apple Proprietary

PAGE TITLE

Interposer: CG (2/3) (501)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

998-33263

J_INT_CG

INTERPOSER-BOT-CG-V59

SMT-PAD

SYM 5 OF 5

507	GND	721	IO721	IO811	811	GND	507
507	PP3V13_WIDE_AVDD1	722	IO722	IO812	812	GND	507
507	GND	723	IO723	IO813	813	GND	507
507	90_MIPI_ISP_FROM_IRCAM_CLK_P	724	IO724	IO814	814	GND	507
507	GND	725	IO725	IO815	815	GND	507
507	GPIO_ISP_CAMS_TO_STROBE_TRIGGER_1V8	726	IO726	IO816	816	GPIO_AP_INTERPOSER_CANARY5_B_TO_C	507
507	GND	727	IO727	IO817	817	GND	507
507	90_MIPI_ISP_FROM_IRCAM_CLK_N	728	IO728	IO818	818	GND	507
507	GND	729	IO729	IO819	819	GND	507
507	GND	730	IO730	IO820	820	GPIO_AP_INTERPOSER_CANARY5_B_TO_C	507
507	GND	731	IO731	IO821	821	GND	507
507	90_MIPI_ISP_FROM_IRCAM_D1_P	732	IO732	IO822	822	GND	507
507	GND	733	IO733	IO823	823	GND	507
507	PP1V2_IRCAM_DVDD	734	IO734	IO824	824	GND	507
507	GND	735	IO735	IO825	825	GND	507
507	90_MIPI_ISP_FROM_IRCAM_D1_N	736	IO736	IO826	826	GND	507
507	GND	737	IO737	IO827	827	GND	507
507	GND	738	IO738	IO828	828	GND	507
507	GND	739	IO739	IO829	829	GPIO_AP_INTERPOSER_CANARY5_D_TO_E	507
507	GND	740	IO740	IO830	830	GND	507
507	GND	741	IO741	IO831	831	GND	507
507	CLK_CAM_PMU1_TO_IRCAM_REGULUS_12M_1V8	742	IO742	IO832	832	GPIO_AP_INTERPOSER_CANARY5_D_TO_E	507
507	GND	743	IO743				
507	PP2V79_IRCAM_AVDD_GUAD_VDD	744	IO744				
507	GND	745	IO745				
507	GND	746	IO746				
507	GND	747	IO747				
507	GND	748	IO748				
507	GND	749	IO749				
507	PP_VDD_MAIN	750	IO750				
507	GND	751	IO751				
507	IO_REGULUS_BI_GUAD_STATUS_1V8	752	IO752				
507	GND	753	IO753				
507	GND	754	IO754				
507	GND	755	IO755				
507	IO_IRCAM_TO_REGULUS_STROBE_1V8	756	IO756				
507	GND	757	IO757				
507	PP_BANFF_A_ANODE	758	IO758				
507	GND	759	IO759				
507	PP1V825_CAM_PMU1_IO_SW	760	IO760				
507	GND	761	IO761				
507	PP_BANFF_FLOOD_ANODE	762	IO762				
507	GND	763	IO763				
507	I2C4_CAM_PMU1_SDA_1V8	764	IO764				
507	GND	765	IO765				
507	PP_BANFF_B_ANODE	766	IO766				
507	GND	767	IO767				
507	I2C4_CAM_PMU1_SCL_1V8	768	IO768				
507	GND	769	IO769				
507	PP_BANFF_DOT_ANODE	770	IO770				
507	GND	771	IO771				
507	GPIO_NUB_FROM_BANFF_B2B_DETECT_L	772	IO772				
507	GND	773	IO773				
507	GPIO_CAM_PMU1_TO_IRCAM_SHDN_L_1V8	774	IO774				
507	CLK_BBPMU_TO_NFC_P_38M4	775	IO775				
507	GND	776	IO776				
507	GND	777	IO777				
507	GND	778	IO778				
507	GND	779	IO779				
507	IO_SLM_BUTTON_SIDE_L_1V8_CONN	780	IO780				
507	GND	781	IO781				
507	PP_VDD_MAIN	782	IO782				
507	GND	783	IO783				
507	IO_SLM_BUTTON_SIDE_L_1V8	784	IO784				
507	GND	785	IO785				
507	GND	786	IO786				
507	GND	787	IO787				
507	NFC_P_ANT_NEG	788	IO788				
507	GND	789	IO789				
507	GND	790	IO790				
507	NFC_P_ANT_NEG	791	IO791				
507	NFC_P_ANT_NEG	792	IO792				
507	GND	793	IO793				
507	GND	794	IO794				
507	GND	795	IO795				
507	GND	796	IO796				
507	GND	797	IO797				
507	PP2V94_FCAM_AVDD	798	IO798				
507	GND	799	IO799				
507	GND	800	IO800				
507	GPIO_CAM_PMU1_TO_FCAM_SHDN_L_1V8	801	IO801				
507	PP1V825_CAM_PMU1_IO_SW	802	IO802				
507	I2C3_CAM_PMU1_SDA_1V8	803	IO803				
507	GND	804	IO804				
507	I2C3_CAM_PMU1_SCL_1V8	805	IO805				
507	GND	806	IO806				
507	GND	807	IO807				
507	GPIO_AP_INTERPOSER_CANARY5_AP_TO_A	808	IO808				
507	GND	809	IO809				
507	GND	810	IO810				

OMIT

Apple Proprietary and Confidential

PAGE TITLE

Interposer: CG (3/3) (502)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

GND	GND	38 39 503 504 505 506 507	NTC_RADIO_PA_P	NTC_RADIO_PA_P	37		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_N	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_N	145		
GND	GND	38 39 503 504 505 506 507	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_P	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_P	145		
PP1V17_FCAM_DVDD	PP1V17_FCAM_DVDD	55	GND	GND	38 39 503 504 505 506 507		
CLK_CAM_PMU1_TO_FCAM_12M_1V8	CLK_CAM_PMU1_TO_FCAM_12M_1V8	55	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_N	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_N	145		
GND	GND	38 39 503 504 505 506 507	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_P	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_P	145		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	ANALOG_MIC2_REAR_TO_CODEC_AIN2_P	ANALOG_MIC2_REAR_TO_CODEC_AIN2_P	78		
GND	GND	38 39 503 504 505 506 507	ANALOG_MIC2_REAR_TO_CODEC_AIN2_N	ANALOG_MIC2_REAR_TO_CODEC_AIN2_N	78		
90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_P	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_P	52	GND	GND	38 39 503 504 505 506 507		
90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_N	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_N	52	PP_CODEC_TO_MIC2_REAR_BIAS	PP_CODEC_TO_MIC2_REAR_BIAS	79		
GND	GND	38 39 503 504 505 506 507	RET_CODEC_FROM_MIC2_REAR	RET_CODEC_FROM_MIC2_REAR	79		
90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_N	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_N	52	GND	GND	38 39 503 504 505 506 507		
90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_P	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_P	52	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	PP_STROBE_DRIVER_CENTER_LED	PP_STROBE_DRIVER_CENTER_LED	65 503		
COIL_TO_SPKRAMP_TOP_VSENSE_POS_CONN	COIL_TO_SPKRAMP_TOP_VSENSE_POS_CONN	82	PP_STROBE_DRIVER_CENTER_LED	PP_STROBE_DRIVER_CENTER_LED	65 503		
COIL_TO_SPKRAMP_TOP_VSENSE_NEG_CONN	COIL_TO_SPKRAMP_TOP_VSENSE_NEG_CONN	82	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	I2C3_AOP_SDA	I2C3_AOP_SDA	16 25		
SPKRAMP_TOP_TO_COIL_OUT_NEG	SPKRAMP_TOP_TO_COIL_OUT_NEG	81 82	I2C3_AOP_SCL	I2C3_AOP_SCL	16 25		
SPKRAMP_TOP_TO_COIL_OUT_POS	SPKRAMP_TOP_TO_COIL_OUT_POS	81 82	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	PP1V825_S2	PP1V825_S2	35 39 102 111 504 506		
GND	GND	38 39 503 504 505 506 507	PP3V0_FLICKER_DET_VDD_S0	PP3V0_FLICKER_DET_VDD_S0	35		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	PCIE_GP0_AP_BI_WLAN_CLKREQ_L	PCIE_GP0_AP_BI_WLAN_CLKREQ_L	28		
NFC_P_ANT_POS	NFC_P_ANT_POS	142 503	NTC_STROBE_MODULE	NTC_STROBE_MODULE	55 65		
NFC_P_ANT_POS	NFC_P_ANT_POS	142 503	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
NFC_P_ANT_POS	NFC_P_ANT_POS	142 503	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	PAC_WLCHGR_COIL1	PAC_WLCHGR_COIL1	44 503		
GND	GND	38 39 503 504 505 506 507	PAC_WLCHGR_COIL1	PAC_WLCHGR_COIL1	44 503		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	PAC_WLCHGR_COIL2	PAC_WLCHGR_COIL2	44 503		
GND	GND	38 39 503 504 505 506 507	PAC_WLCHGR_COIL2	PAC_WLCHGR_COIL2	44 503		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	90_PCIE_GP0_AP_TO_WLAN_TX_P	90_PCIE_GP0_AP_TO_WLAN_TX_P	28		
GND	GND	38 39 503 504 505 506 507	90_PCIE_GP0_AP_TO_WLAN_TX_N	90_PCIE_GP0_AP_TO_WLAN_TX_N	28		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	90_PCIE_GP0_AP_FROM_WLAN_RX_N	90_PCIE_GP0_AP_FROM_WLAN_RX_N	28		
GND	GND	38 39 503 504 505 506 507	90_PCIE_GP0_AP_FROM_WLAN_RX_P	90_PCIE_GP0_AP_FROM_WLAN_RX_P	28		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	90_PCIE_GP0_AP_TO_WLAN_REFCLK_P	90_PCIE_GP0_AP_TO_WLAN_REFCLK_P	28		
GND	GND	38 39 503 504 505 506 507	90_PCIE_GP0_AP_TO_WLAN_REFCLK_N	90_PCIE_GP0_AP_TO_WLAN_REFCLK_N	28		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA	SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA	142		
GND	GND	38 39 503 504 505 506 507	SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK	SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK	142		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	PCIE_GP0_AP_TO_WLAN_PERST_L	PCIE_GP0_AP_TO_WLAN_PERST_L	28		
GND	GND	38 39 503 504 505 506 507	GPIO_AP_FROM_WLAN_TIME_SYNC	GPIO_AP_FROM_WLAN_TIME_SYNC	26		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
NTC_STOCKHOLM	NTC_STOCKHOLM	142	CLK_GPIO_S4_PMU_TO_WLAN_32K	CLK_GPIO_S4_PMU_TO_WLAN_32K	38		
PP1V998_FCAM_VDDAF	PP1V998_FCAM_VDDAF	55	GPIO_PMU_FROM_WLAN_HOST_WAKE	GPIO_PMU_FROM_WLAN_HOST_WAKE	38		
GND	GND	38 39 503 504 505 506 507	SPMI1_COEX_AOP_TO_BB_WLAN_CLK	SPMI1_COEX_AOP_TO_BB_WLAN_CLK			
GPIO_AP_INTERPOSER_CANARY6_B_TO_C	GPIO_AP_INTERPOSER_CANARY6_B_TO_C	503	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GPIO_S4_SE_TO_BT_PKT_RDY	GPIO_S4_SE_TO_BT_PKT_RDY	142		
GND	GND	38 39 503 504 505 506 507	SPMI1_COEX_AOP_BI_BB_WLAN_DATA	SPMI1_COEX_AOP_BI_BB_WLAN_DATA			
GND	GND	38 39 503 504 505 506 507	GPIO_AP_INTERPOSER_CANARY7_B_TO_C	GPIO_AP_INTERPOSER_CANARY7_B_TO_C	503		
GPIO_AP_INTERPOSER_CANARY6_B_TO_C	GPIO_AP_INTERPOSER_CANARY6_B_TO_C	503	I2C_S4_BT_TO_SE_SCL	I2C_S4_BT_TO_SE_SCL	142		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	I2C_S4_BT_TO_SE_SDA	I2C_S4_BT_TO_SE_SDA	142		
PP1V24_S4	PP1V24_S4	33 39 142 506	GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON	GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON	38		
PP1V825_S4	PP1V825_S4	33 39 126 504 506	PP_VDD_MAIN	PP_VDD_MAIN	39 40 42 126 503 504 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GPIO_AP_FROM_BT_AUDIO_SYNC	GPIO_AP_FROM_BT_AUDIO_SYNC	26		
PP_VDD_MAIN	PP_VDD_MAIN	39 40 42 126 503 504 506 507	PP_VDD_MAIN	PP_VDD_MAIN	39 40 42 126 503 504 506 507		
GND	GND	38 39 503 504 505 506 507	GPIO_AP_INTERPOSER_CANARY7_B_TO_C	GPIO_AP_INTERPOSER_CANARY7_B_TO_C	503		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	GPIO_NUB_TO_BB_DEBUG_EN	GPIO_NUB_TO_BB_DEBUG_EN	26		
GND	GND	38 39 503 504 505 506 507	GPIO_NUB_FROM_BB_WDOG_L	GPIO_NUB_FROM_BB_WDOG_L	26		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
IO_BUTTON_RINGER_L	IO_BUTTON_RINGER_L	26 38	GPIO_SEQ_PMU_TO_BBPMU_RESET_L	GPIO_SEQ_PMU_TO_BBPMU_RESET_L	38		
IO_BUTTON_VOL_UP_L_1V8	IO_BUTTON_VOL_UP_L_1V8	145	GPIO_PMU_FROM_BB_PCIE_HOST_WAKE_L	GPIO_PMU_FROM_BB_PCIE_HOST_WAKE_L	38		
GPIO_AP_INTERPOSER_CANARY6_AP_TO_A	GPIO_AP_INTERPOSER_CANARY6_AP_TO_A	26	GPIO_AP_INTERPOSER_CANARY7_AP_TO_A	GPIO_AP_INTERPOSER_CANARY7_AP_TO_A	26		
IO_BUTTON_VOL_DOWN_L_1V8	IO_BUTTON_VOL_DOWN_L_1V8	145	PCIE_GP1_AP_TO_BB_PERST_L	PCIE_GP1_AP_TO_BB_PERST_L	28		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		
GND	GND	38 39 503 504 505 506 507	PCIE_GP1_AP_BI_BB_CLKREQ_L	PCIE_GP1_AP_BI_BB_CLKREQ_L	28		
GND	GND	38 39 503 504 505 506 507	GND	GND	38 39 503 504 505 506 507		

Apple Confidential
Apple Proprietary

PAGE TITLE

Interposer: Aliases (1/5) (503)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

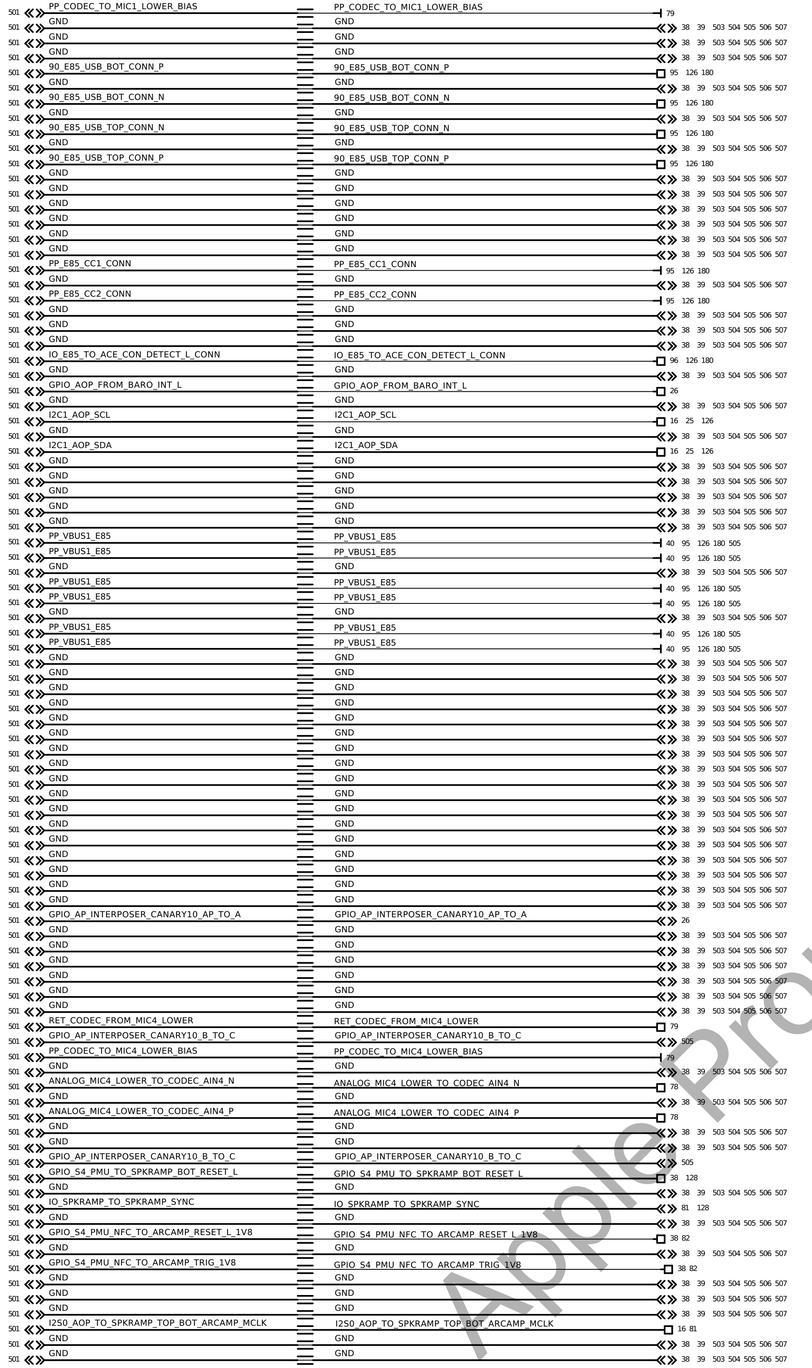
8	7	6	5	4	3	2	1

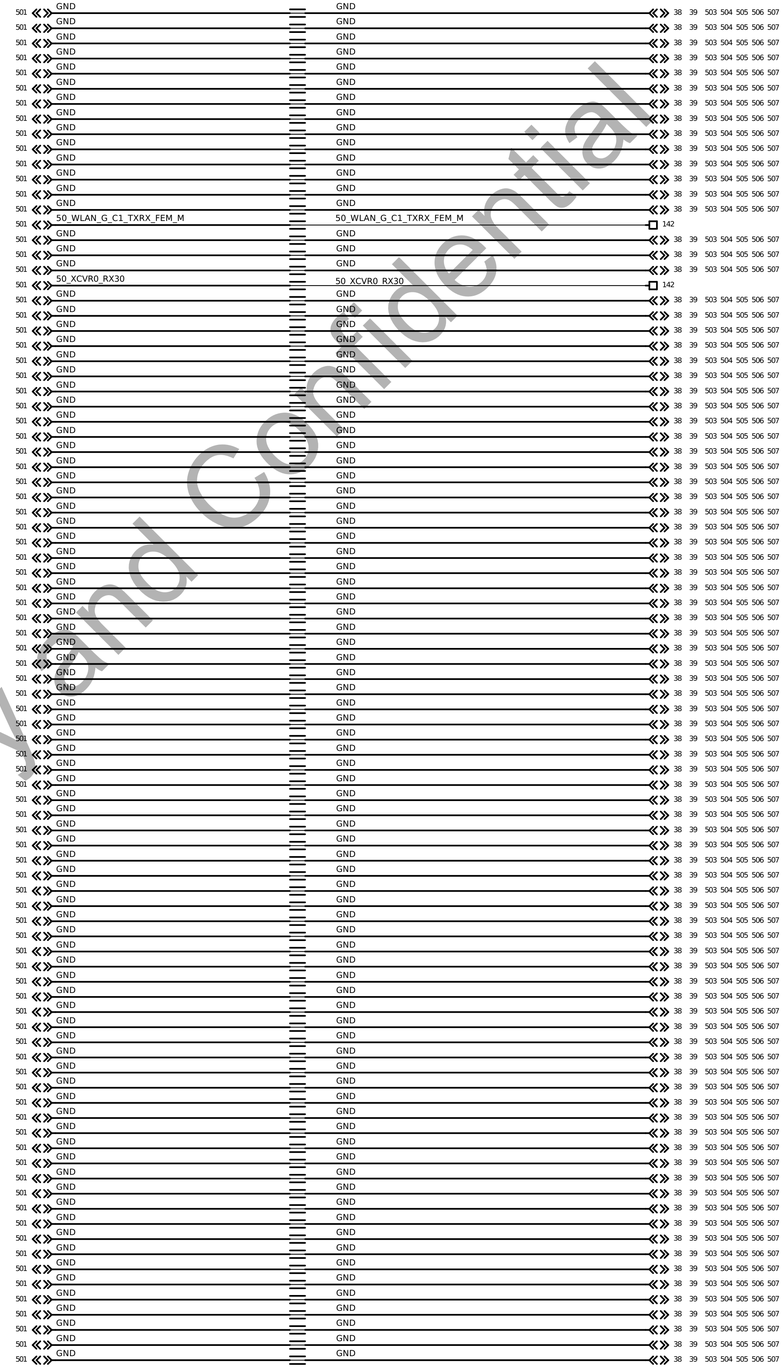
| | | |

8	7	6	5	4	3	2	1

D							D
C							C
B							B
A							A

8	7	6	5	4	3	2	1





Apple Confidential
Apple Proprietary

PAGE TITLE

Interposer: Aliases (3/5) (505)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

8	7	6	5	4	3	2	1

D			D
C			C
B			B
A			A

8	7	6	5	4	3	2	1

| | | | | | | |

502	GND	GND	38 39 503 504 505 506 507
502	PP3V13_WIDE_AVDD1	PP3V13_WIDE_AVDD1	55
502	GND	GND	38 39 503 504 505 506 507
502	90_MIPI_ISP_FROM_IRCAM_CLK_P	90_MIPI_ISP_FROM_IRCAM_CLK_P	28
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_ISP_CAMS_TO_STROBE_TRIGGER_1V8	GPIO_ISP_CAMS_TO_STROBE_TRIGGER_1V8	65
502	GND	GND	38 39 503 504 505 506 507
502	90_MIPI_ISP_FROM_IRCAM_CLK_N	90_MIPI_ISP_FROM_IRCAM_CLK_N	28
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	90_MIPI_ISP_FROM_IRCAM_D1_P	90_MIPI_ISP_FROM_IRCAM_D1_P	28
502	GND	GND	38 39 503 504 505 506 507
502	PP1V2_IRCAM_DVDD	PP1V2_IRCAM_DVDD	55
502	GND	GND	38 39 503 504 505 506 507
502	90_MIPI_ISP_FROM_IRCAM_D1_N	90_MIPI_ISP_FROM_IRCAM_D1_N	28
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	CLK_CAM_PMU1_TO_IRCAM_REGULUS_12M_1V8	CLK_CAM_PMU1_TO_IRCAM_REGULUS_12M_1V8	55 70
502	GND	GND	38 39 503 504 505 506 507
502	PP2V79_IRCAM_AVDD_GUAD_VDD	PP2V79_IRCAM_AVDD_GUAD_VDD	55
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	PP_VDD_MAIN	PP_VDD_MAIN	39 40 42 126 503 504 506 507
502	GND	GND	38 39 503 504 505 506 507
502	IO_REGULUS_BI_GUAD_STATUS_1V8	IO_REGULUS_BI_GUAD_STATUS_1V8	70
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	IO_IRCAM_TO_REGULUS_STROBE_1V8	IO_IRCAM_TO_REGULUS_STROBE_1V8	70
502	GND	GND	38 39 503 504 505 506 507
502	PP_BANFF_A_ANODE	PP_BANFF_A_ANODE	70
502	GND	GND	38 39 503 504 505 506 507
502	PP1V825_CAM_PMU1_IO_SW	PP1V825_CAM_PMU1_IO_SW	53 55 145 507
502	GND	GND	38 39 503 504 505 506 507
502	PP_BANFF_FLOOD_ANODE	PP_BANFF_FLOOD_ANODE	70
502	GND	GND	38 39 503 504 505 506 507
502	I2C4_CAM_PMU1_SDA_1V8	I2C4_CAM_PMU1_SDA_1V8	54 55
502	GND	GND	38 39 503 504 505 506 507
502	PP_BANFF_B_ANODE	PP_BANFF_B_ANODE	70
502	GND	GND	38 39 503 504 505 506 507
502	I2C4_CAM_PMU1_SCL_1V8	I2C4_CAM_PMU1_SCL_1V8	54 55
502	GND	GND	38 39 503 504 505 506 507
502	PP_BANFF_DOT_ANODE	PP_BANFF_DOT_ANODE	70 507
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_NUB_FROM_BANFF_B2B_DETECT_L	GPIO_NUB_FROM_BANFF_B2B_DETECT_L	26 27
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_CAM_PMU1_TO_IRCAM_SHDN_L_1V8	GPIO_CAM_PMU1_TO_IRCAM_SHDN_L_1V8	55
502	CLK_BBPMU_TO_NFC_P_38M4	CLK_BBPMU_TO_NFC_P_38M4	142
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	IO_SLM_BUTTON_SIDE_L_1V8_CONN	IO_SLM_BUTTON_SIDE_L_1V8_CONN	127
502	GND	GND	38 39 503 504 505 506 507
502	PP_VDD_MAIN	PP_VDD_MAIN	39 40 42 126 503 504 506 507
502	GND	GND	38 39 503 504 505 506 507
502	IO_SLM_BUTTON_SIDE_L_1V8	IO_SLM_BUTTON_SIDE_L_1V8	145
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	NFC_P_ANT_NEG	NFC_P_ANT_NEG	142 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	NFC_P_ANT_NEG	NFC_P_ANT_NEG	142 507
502	NFC_P_ANT_NEG	NFC_P_ANT_NEG	142 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	PP2V94_FCAM_AVDD	PP2V94_FCAM_AVDD	55
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_CAM_PMU1_TO_FCAM_SHDN_L_1V8	GPIO_CAM_PMU1_TO_FCAM_SHDN_L_1V8	55
502	PP1V825_CAM_PMU1_IO_SW	PP1V825_CAM_PMU1_IO_SW	53 55 145 507
502	I2C3_CAM_PMU1_SDA_1V8	I2C3_CAM_PMU1_SDA_1V8	54 55
502	GND	GND	38 39 503 504 505 506 507
502	I2C3_CAM_PMU1_SCL_1V8	I2C3_CAM_PMU1_SCL_1V8	54 55
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_AP_INTERPOSER_CANARY5_AP_TO_A	GPIO_AP_INTERPOSER_CANARY5_AP_TO_A	26
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507

502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_AP_INTERPOSER_CANARY5_B_TO_C	GPIO_AP_INTERPOSER_CANARY5_B_TO_C	507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_AP_INTERPOSER_CANARY5_B_TO_C	GPIO_AP_INTERPOSER_CANARY5_B_TO_C	507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_AP_INTERPOSER_CANARY5_D_TO_E	GPIO_AP_INTERPOSER_CANARY5_D_TO_E	507
502	GND	GND	38 39 503 504 505 506 507
502	GND	GND	38 39 503 504 505 506 507
502	GPIO_AP_INTERPOSER_CANARY5_D_TO_E	GPIO_AP_INTERPOSER_CANARY5_D_TO_E	507

Apple Proprietary and Confidential

PAGE TITLE

Interposer: Aliases (5/5) (507)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

REV	ECN	DESCRIPTION OF REVISION	CK APPD / DATE
5			2024-09-17

HIER_NFC_CG

SHEET	PAGE/CSA	CONTENTS	SYNC LABEL	SYNC DATE
1	1	TOC		
2	2	NFC_IO_BOM		
3	75	NFC_P		
4	76	NFC_P_FE		

Apple Proprietary and Confidential

DRAWING TITLE
SCH,MLB,CG,

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Primary Chip

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
338S01082	RFSKU:US	NFC_P	CRITICAL	1	IC,EOS,SN300V3,B21,PROD,BS1,WN0,WLCSP79
338S01081	RFSKU:RS||RFSKU:ROW||RFSKU:CHN	NFC_P	CRITICAL	1	IC,EOS,SN300V3,B21,PROD,NBS,WZ0,WLCSP79

RTM7C.5 PRIMARY MATCHING

PRIMARY CS:

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
131S00569	RTM7C.5	C7514_S,C7542_S	CRITICAL	2	CAP,C0G,680PF,2%,50V,0201
131S00017	RTM7C.5	C7543_S,C7555_S	CRITICAL	2	CAP,CER,NP0/C0G,47PF,+/-2%,50V,0201
131S00017	RTM7C.5	C7515_S,C7541_S	CRITICAL	2	CAP,CER,NP0/C0G,47PF,+/-2%,50V,0201

PRIMARY CP:

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
131S00547	RTM7C.5	C7546_S	CRITICAL	1	CAP,C0G,1000PF,2%,50V,0201
131S00017	RTM7C.5	C7547_S	CRITICAL	1	CAP,CER,NP0/C0G,47PF,+/-2%,50V,0201
131S00017	RTM7C.5	C7548_S	CRITICAL	1	CAP,CER,NP0/C0G,47PF,+/-2%,50V,0201
131S00017	RTM7C.5	C7558_S	CRITICAL	1	CAP,CER,NP0/C0G,47PF,+/-2%,50V,0201
131S0883	NOSTUFF	C7559_S	CRITICAL	1	CAP,CER,NP0/C0G,220PF,2%,50V,0201
131S00117	NOSTUFF	C7560_S	CRITICAL	1	CAP,CER,NP0/C0G,120PF,+/-2%,50V,0201

PRIMARY EMC:

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
131S00547	RTM7C.5	C7513_S,C7554_S	CRITICAL	2	CAP,C0G,1000PF,2%,50V,0201
131S00550	RTM7C.5	C7550_S,C7551_S	CRITICAL	2	CAP,C0G,470PF,2%,50V,0201
152S01530	RTM7C.5	L7500_S,L7501_S	CRITICAL	2	IND,MULT,75NH,4%,1.05A,156 MOHM,0402
131S00478	RTM7C.5	C7561_S,C7562_S	CRITICAL	2	CAP,C0G,82PF,2%,25V,01005
131S00019	RTM7C.5	C7552_S,C7553_S	CRITICAL	2	CAP,CER,NP0/C0G,150PF,+/-2%,50V,0201

ALTERNATE PARTS

ALTERNATE PART NO.	PRIMARY PART NO.	BOMOPTION	REFERENCE DESIGNATORS	COMMENT
152S01697	152S00622	ALL	L7502_S	FERR BD,10 OHM,50%,1A,0.05 OHM DCR,0201
155S01010	155S00161	ALL	FL7500_S	IND,MLD,1UH,2.1A,TAIYO
338S01083	338S01082	RFSKU:US	NFC_P	IC,EOS,SN300V3,B21,PROD,BS2,BU0,WLCSP79

ESIM/PSIM:

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
117S00067	RFSKU:CHN	C7504_S	CRITICAL	1	RES,TK,0 OHM,1/32W,01005
132S00014	RFSKU:US||RFSKU:RS||RFSKU:ROW	C7504_S	CRITICAL	1	CAP,CER,X5R,0.22UF,10%,6.3V,01005

GPIO

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
118S00310	RTM7C.5	R7521_S	CRITICAL	1	RES,TK,60.4K OHM,1%,1/32W,01005

NFC PRIMARY IO PORTS

PMU CONNECTIONS

582 — PP_VDD_MAIN — VOLTAGE=3.8 V
582 — PP1V24_NFC_S2 — VOLTAGE=1.24 V
582 — PP1V24_S4 — VOLTAGE=1.24 V
582 — GPIO_SEQ_PMU_TO_NFC_RST_L

AOP CONNECTIONS

582 — SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK
582 — SPMI0_HEB_AOP_BI_BB_WLAN_NFC_P_DATA_R

BASEBAND CONNECTIONS

582 — BB_FROM_EOS_DET
582 — BB_TO_EOS_CLK
582 — BB_TO_EOS_DAT
582 — BB_TO_EOS_RST
582 — VDD_SIM1_EOS
582 — CLK_BBPMU_TO_NFC_P_38M4
582 — GPIO_NFC_P_TO_BBPMU_CLK_EN

WLAN/BT CONNECTIONS

582 — I2C_S4_BT_TO_SE_SCL
582 — GPIO_S4_SE_TO_BT_PKT_RDY
582 — I2C_S4_BT_TO_SE_SDA

ARCAMP CONNECTIONS

582 — GPIO_S4_NFC_TO_ARCAMP_RESET_L_1V8
582 — GPIO_S4_NFC_TO_ARCAMP_TRIG_1V8

NFC RF

583 — NFC_P_ANT_POS
583 — NFC_P_ANT_NEG

MISC

582 — NFC_P_TEST_OUT
582 — NTC_STOCKHOLM

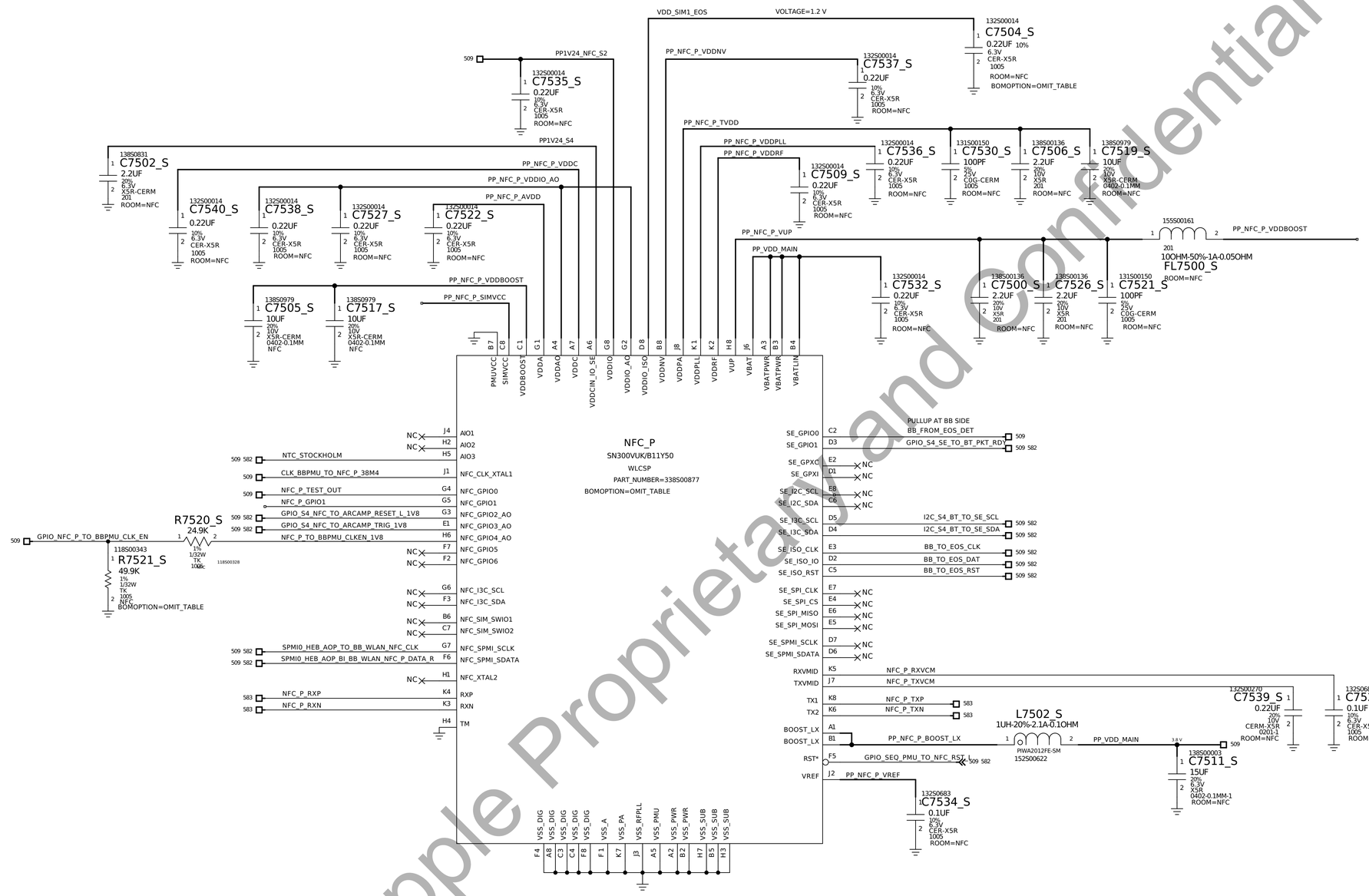
Apple Proprietary and Confidential

PAGE TITLE
NFC_IO_BOM (2)

Apple Inc.

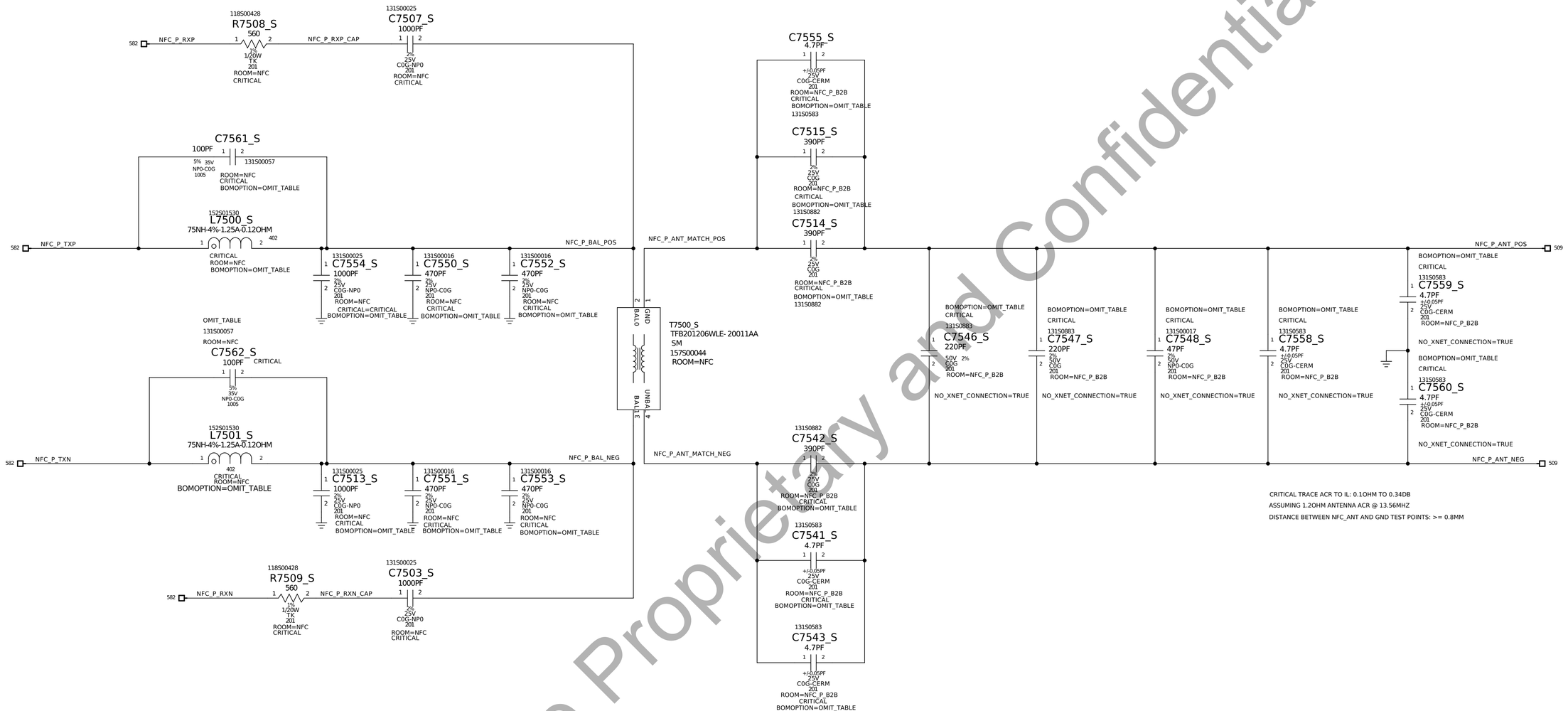
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

PRIMARY NFC CONTROLLER



Apple Proprietary and Confidential

PRIMARY NFC FRONT END



Apple Proprietary and Confidential

PAGE TITLE

NFC_P_FE (76)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

REV	ECN	DESCRIPTION OF REVISION	CK APPD / DATE
5			2024-09-17

SHEET	PAGE/CSA	CONTENTS		
1	1	TABLE OF CONTENTS		
2	2	HIER_WIFI_CG BOM TABLE AND IO PORTS		
3	3	2G4 rFEM [LAT]		

Apple Proprietary and Confidential

DRAWING TITLE

SCH,MLB,CG

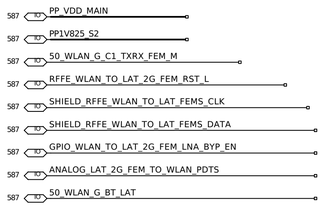
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

REV	ECN	DESCRIPTION OF REVISION	CK APPD / DATE
5			2024-09-17

HIER_WIFI_CG



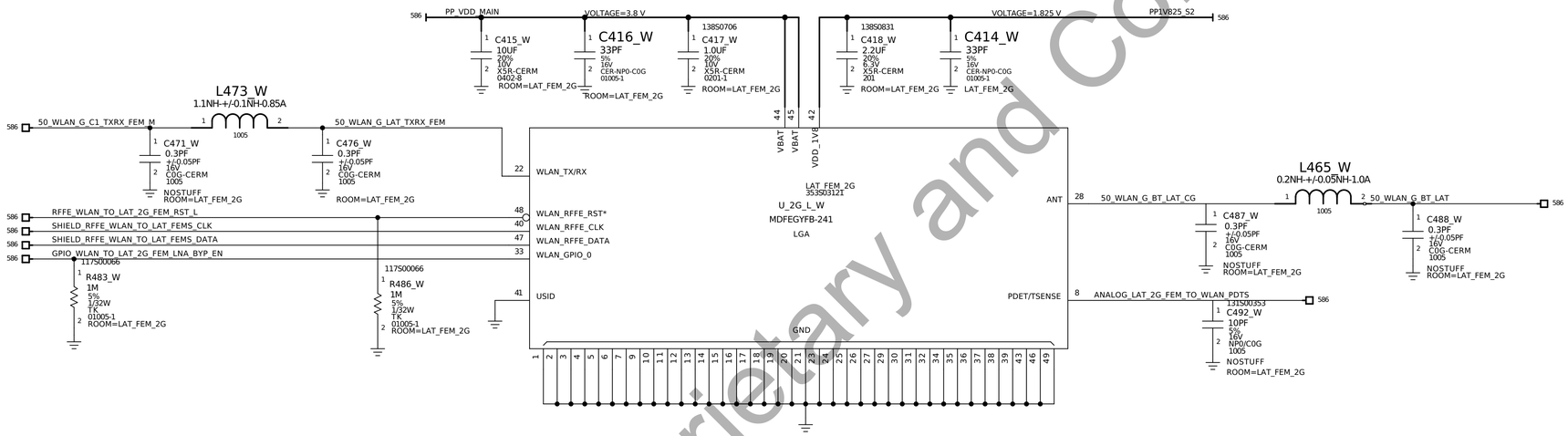
Apple Proprietary and Confidential

DRAWING TITLE
SCH,MLB,CG,

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

LAT 2.4 GHZ RFEM



Apple Proprietary and Confidential

PAGE TITLE
2G4 rFEM [LAT] (3)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

REV	ECN	DESCRIPTION OF REVISION	CK APPD / DATE
5			2024-09-17

SHEET	PAGE/CSA	CONTENTS		
1	1	TITLE PAGE		
2	2	PORTS		
3	3	CONSTRAINTS		
4	4	FR1 LAT LB/2G SPAD		

Apple Proprietary and Confidential

DRAWING TITLE

SCH,MLB,CG

Apple Inc.

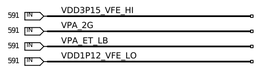
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

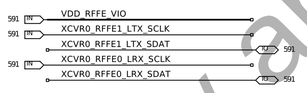
PORTS

CONNECTION FROM/TO MLB_BG

POWER



RFFE



LB+2G SPAD

FR1 LAT MIMO DSM

MOVED BACK TO HIER_RADIO_S_BG

Apple Proprietary and Confidential

PAGE TITLE: PORTS (2)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

CONSTRAINTS

Grouping Constraints

POWER CONSTRAINTS

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	----- ---	CONSTRAINT SET	DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
PWR_SHAPE	P	PWR_SHAPE	VPA_ET*; VPA_2G*	?
PWR_300UM	P	PWR_300UM	VDD3P15_VFE_HI	?
PWR_300UM	P	PWR_300UM	VDD1P12_VFE_LO	?
PWR_300UM	P	PWR_300UM	VDD_*LNA	?
PWR_150UM	P	PWR_150UM	VDD_RFFE_VIO*	?

RF CONSTRAINTS

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	----- ---	CONSTRAINT SET	DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
50_THIN_SE	P	A_50_THIN_SE	50_HB*	?
50_THIN_SE	P	A_50_THIN_SE	50_LB_*	?
50_WIDE_SE	P	A_50_WIDE_SE	50_LBDSM_TXIN	?
50_THIN_SE	P	A_50_THIN_SE	50_LMIMO*	?

SENSITIVE TRACE SHEILD

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	----- ---	CONSTRAINT SET	DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
RFFE_SHIELD	S	A_DIELECTRIC_1.5X	XCVR0_RFFE*	?

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	----- ---	CONSTRAINT SET	DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
50_LMB_HB_RX	P	A_50_THIN_SE	50_XCVR0_RX30	?
50_2G_LB_SPAD_TX	P	A_50_THIN_SE	50_XCVR0_TX1_LB,50_XCVR0_TX2_LB,50_XCVR0_TX0_2G	?

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_WIDE_SE	GND	A_DIELECTRIC_1.6X_50_WIDE_SE
50_THIN_SE	GND	A_DIELECTRIC_2X_50_THIN_SE
50_LMB_HB_RX	GND	A_DIELECTRIC_2X_50_THIN_SE
50_2G_LB_SPAD_TX	GND	A_DIELECTRIC_2X_50_THIN_SE

SPACING (SCSET)

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	----- ---	CONSTRAINT SET	DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
50_WIDE_SE	S	A_DIELECTRIC_2X_50_WIDE_SE	=	?
50_THIN_SE	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_LMB_HB_RX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_2G_LB_SPAD_TX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?

Apple Proprietary and Confidential

PAGE TITLE

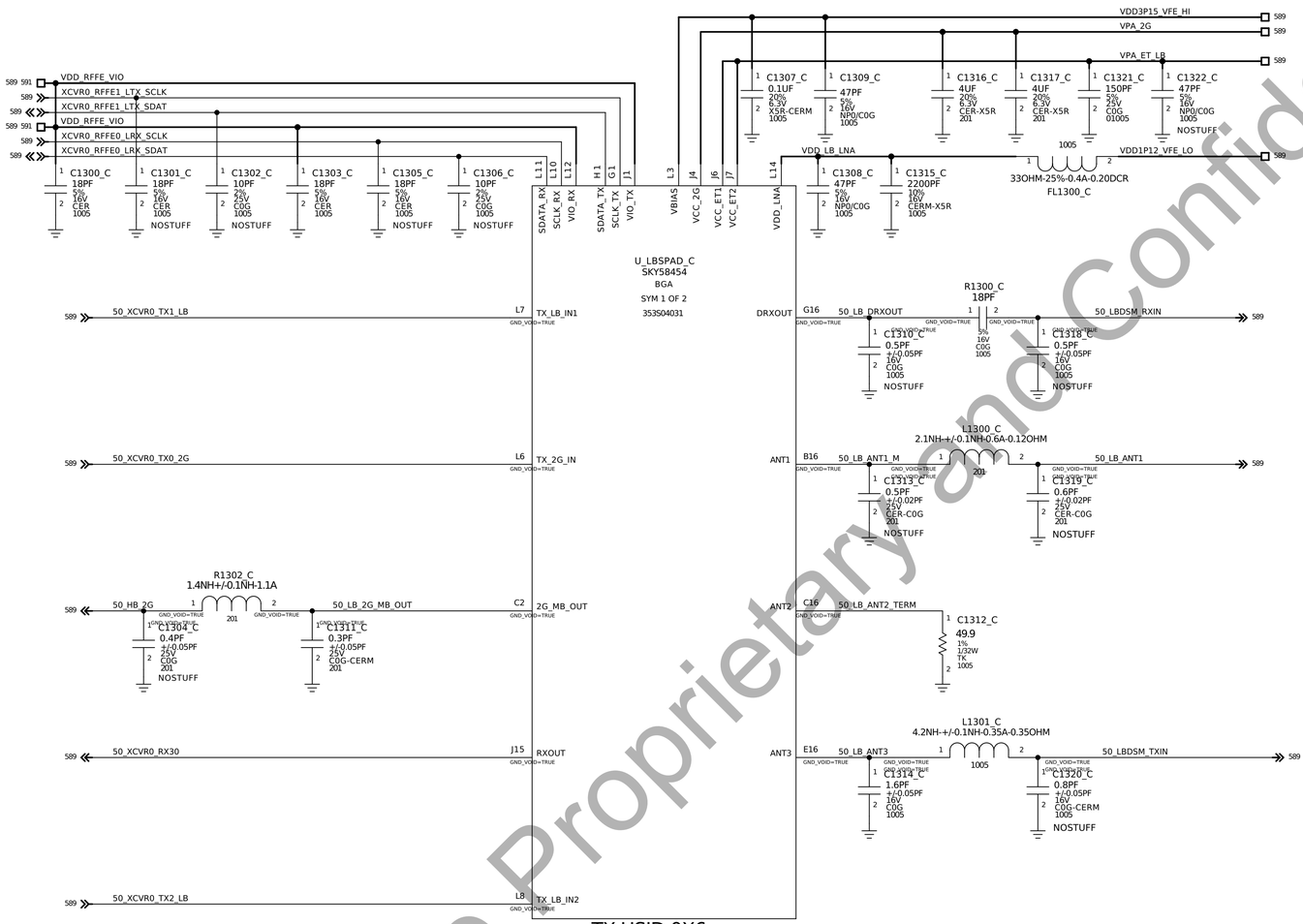
CONSTRAINTS

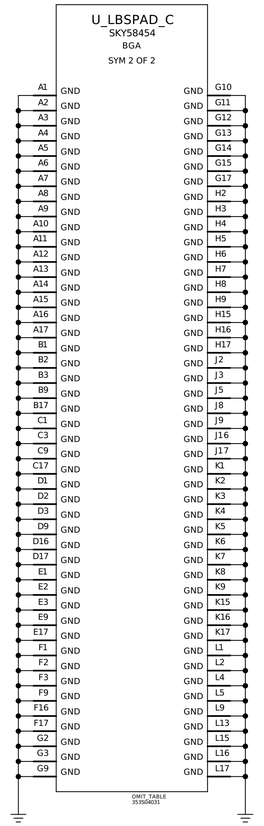
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

LB+2G SPAD





LB S-PAD RF SKU

	PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
WW SKU	353S04031	RFSKU:RS	U_LBSPAD_C	CRITICAL	1	IC,PAD,2G+LB,SKY58454,DSMBGA112
WW SKU	353S04031	RFSKU:US	U_LBSPAD_C	CRITICAL	1	IC,PAD,2G+LB,SKY58454,DSMBGA112
RS SKU	353S04051	RFSKU:CHN	U_LBSPAD_C	CRITICAL	1	IC,PAD, 2G+LB,SKY58455,SKU,DSMBGA112
RS SKU	353S04051	RFSKU:ROW	U_LBSPAD_C	CRITICAL	1	IC,PAD, 2G+LB,SKY58455,SKU,DSMBGA112

Apple Proprietary and Confidential

PAGE TITLE
FR1 LAT LB/2G SPAD (4)

Apple Inc.

DRAWING NUMBER

SIZE

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

MLB

SHEET	PAGE/CSA	CONTENTS	SYNC LABEL	SYNC DATE
1	1	TABLE OF CONTENTS		
2	2	SYSTEM: BOM Tables (1/2)		
3	3	SYSTEM: BOM Tables (2/2)		
4	9	SYSTEM: Mechanical		
5	50	SYS PWR: NTCs (Bottom)		
6	51	UF DUMMIES		
7	80	AUDIO: Bot Speaker Amp		
8	83	HAPTIC: Haptic Amp		
9	84	HAPTIC: Sakonnet		
10	104	B2B: Battery		
11	105	B2B: BG Flex		
12	106	B2B: Camera Wide		
13	109	B2B: FCAM		
14	110	B2B: SMP		
15	113	B2B: Dock		
16	114	B2B: SIM + Arc		
17	115	B2B: Button		
18	120	B2B: UAT1		
19	121	B2B: UAT2		
20	123	B2B: LAT		
21	141	SYSTEM: Aliases		
22	327	TESTING: Test Points		
23	329	TESTING: Probe Points		
24	342	HIERARCHIES: BOT: Radio + NFC		
25	343	HIERARCHIES: BOT: WiFi		
26	600	Interposer: BG (1/3)		
27	601	Interposer: BG (2/3)		
28	602	Interposer: BG (3/3)		
29	603	INTERPOSER: Aliases (1/5)		
30	604	INTERPOSER: Aliases (2/5)		
31	605	INTERPOSER: Aliases (3/5)		
32	606	INTERPOSER: Aliases (4/5)		
33	607	INTERPOSER: Aliases (5/5)		
34	1	TOC		
35	2	NFC_IO		
36	75	NFC_P_FE		
37	1	TABLE OF CONTENTS		
38	2	WLAN SYMBOL IO PORTS		
39	3	BOM Table		
40	4	Probe Points		

SHEET	PAGE/CSA	CONTENTS		
41	5	THELONIOUS		
42	6	5G rFEM (UAT)		
43	7	5G rFEM (LAT)		
44	8	2G4 rFEM (UAT)		
45	9	2G4 rFEM (LAT)		
46	1	TITLE PAGE		
47	2	PORTS		
48	3	BLOCK DIAGRAM		
49	4	BBPMU (1/2)		
50	5	BBPMU (2/2)		
51	6	BASEBAND (1/3)		
52	7	BASEBAND (2/3)		
53	8	BASEBAND (3/3)		
54	9	CLOCKING		
55	10	CARPO		
56	11	CARPO POWER		
57	12	ETIC		
58	13	FR1 LAT LB/2G SPAD		
59	14	FR1 LAT HB SPAD		
60	15	FR1 LAT UHB SPAD		
61	16	FR1 LAT MIMO DSM		
62	17	FR1 LAT COUPLERS		
63	18	FR1 UAT TX DSM		
64	19	FR1 UAT UHB DSM		
65	20	FR1 UAT RX (1/2)		
66	21	FR1 UAT RX (2/2)		
67	22	FR1 UAT COUPLERS		
68	23	FR1 UAT ANTENNAS & GPS		
69	24	FR1 ANTENNA TUNERS		
70	25	TEST POINTS		
71	26	CONSTRAINTS		

CK
APPD

Apple Proprietary and Confidential

DRAWING TITLE
SCH,MLB,BG,

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Multi-Vendor Criticals

Capacitors

In descending order of value, then package size

PART NUMBER	COMMENT
138S0979	CAP,CER,X5R,10UF,20%,10V,0402,H=0.65MM
138S0692	CAP,CER,X5R,1UF,20%,6.3V,0201
138S00014	CAP,CER,X5R,1UF,20%,16V,0201,H=0.39MM
132S0534	CAP,CER,X5R,0.1UF,10%,25V,0201
132S00258	CAP,CER,X7R,330PF,10%,16V,01005
131S0883	CAP,CER,NP0/C0G,220PF,2%,50V,0201
131S00543	CAP,CER,C0G,220PF,5%,25V,01005
131S00057	CAP,CER,NP0/C0G,100PF,5%,35V,01005
138S0968	CAP,CER,X5R,4.2UF,10%,16V,0402,H=0.55MM
131S00294	CAP,C0G,330PF,5%,25V,0201
132S00030	CAP,CER,0.1UF,10%,10V,X6S,0201
131S00732	CAP,CER,NP0/C0G,18PF,5%,16V,01005
132S00051	CAP,X7R,330PF,10%,25V,0201
131S00730	CAP,CER,NP0/C0G,100PF,5%,16V,01005

PART NUMBER	COMMENT
131S00731	CAP,CER,NPO/COG,56PF,5%,25V,01005
131S00740	CAP,CER,NPO/COG,47PF,5%,16V,01005
131S00742	CAP,CER,NPO/COG,33PF,5%,16V,01005
131S00291	CAP,CER,NPO/COG,27PF,5%,16V,01005
131S00741	CAP,CER,COG,22PF,5%,16V,01005
131S00333	CAP,CER,COG,10PF,2%,25V,01005
131S00383	CAP,CER,NPO/COG,4.7PF,+/-0.1PF,16V,01005

Ferrites

PART NUMBER	COMMENT
155S0576	FERR BD,10 OHM,50%,750MA,0.07 DCR,01005

2020 MLCCs

16uF, 0402, 4V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00484	138S00313	ALL	CAP,X5R,16UF,20%,4V,T,0402
138S00314	138S00313	ALL	CAP,X5R,16UF,20%,4V,M,0402
138S00315	138S00313	ALL	CAP,X5R,16UF,20%,4V,M,0402

Primary: Murata
Taiyo
Kyocera
Samsung

15uF, 0402

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00048	138S00003	(C8000-C8002,C8004,C8300-C8302,C8304)	0402,15uF,6.3V, Kyocera
138S00406	138S00003		0402,13uF,6.3V, Murata Gen2
138S00388	138S00003		0402,9uF,6.3V, Samco Gen2

Primary: Murata
Kyocera
Murata Gen 2
Samsung Gen 2

://134023334 ([V59] [CRB] DQ 8x 138S00048 locations on BG, add Gen2 cap options as ALT)

13uF, 0402, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00405	138S00406	ALL	CAP,X5R,13UF,20%,6.3V,4.9UF@3V,K,0402
138S00388	138S00406	ALL	CAP,X5R,9UF,20%,6.3V,4.9@3V,SAM,0402

Primary: Murata
Kyocera
Samsung

7.5uF, 0402, 4V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00024	138S0986	ALL	CAP,CER,3-TERM,7.5UF,20%,4V,0402

Primary: Murata
Taiyo

PART NUMBER	COMMENT
138S00313	CAP,CER,X5R,16UF,20%,4V,0402
138S00003	0402,15uF,6.3V
138S00406	CAP,X5R,13UF,20%,6.3V,4.9UF@3V,M,0402
138S0986	CAP,CER,3-TERM,7.5UF,20%,4V,0402

Capacitor Alternates

4uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	COMMENT
138S00116	138S00071	CAP,X5R,4UF,0201,0.55MM,TAIYO
138S00117	138S00071	CAP,X5R,4UF,0201,0.55MM,KYOCERA
138S00515	138S00071	CAP,X5R,4UF,0201,0.55MM,SEMCO

PART NUMBER	COMMENT
138S00071	0201,X5R,4UF,0201,0.55MM,MURATA

4.2uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00518	138S0968	ALL	CAP,CER,X5R,4.2UF,10%,16V,K,0402H0.55,KYOCERA
138S00513	138S0968	ALL	CAP,CER,X5R,4.2UF,10%,16V,S,0402,H0.55,SEMCO

://134475084 ([V59][CRB][BOM] Add more ALTs for 138S00014 and 138S0968 in BOM table)

2.2uF, 0201, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S0831	138S00450	ALL	CAP,CER,X5R,2.2UF,20%,6.3V,0201
138S00516	138S00450	ALL	CAP,X5R,2.2UF,20%,6.3V,S,HZ0201
138S00049	138S00450	ALL	CAP,CER,X5R,2.2UF,20%,6.3V,0201

PART NUMBER	COMMENT
138S00450	CAP,CER,X5R,2.2UF,20%,6.3V,0201

1uF, 0201

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S0739	138S0706	ALL	CAP,CER,X5R,1UF,20%,10V,0201,SAMSUNG
138S0945	138S0706	ALL	CAP,CER,X5R,1UF,20%,10V,0201,KYOCERA
138S00517	138S00014	ALL	CAP,X5R,1UF,20%,16V,0201,H=0.39MM,KYOCERA
138S00085	138S00014	ALL	CAP,X5R,1UF,20%,16V,0201,H=0.39MM,MURATA

PART NUMBER	COMMENT
138S0706	CAP,X5R,1UF,20%,10V,0201

0.47uF, 01005

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00128	138S00412	ALL	CAP,CER,X5R,0.47UF,20%,6.3V,KYO,01005
138S00519	138S00412		CAP,X5R,0.47UF,20%,6.3V,0.09@3V,S,01005

PART NUMBER	COMMENT
138S00412	CAP,X5R,0.47UF,20%,6.3V,MUR,01005

://134474177 ([V59][CRB][BOM]Taiyo (138S00269) 0.47uF cap DQ)) ://134406786 ([V59][CRB][BOM] Add 138S00519 SEMCO BOM option)

0.22uF, 01005

ALTERNATE PART NO.	PRIMARY PART NO.	COMMENT
132S00303	132S00014	01005,0.22uF,6.3V,Taiyo
132S00304	132S00014	01005,0.22uF,6.3V,Kyocera

PART NUMBER	COMMENT
132S00014	01005,0.22uF, 6.3V

0.1uF, 01005, 6.3V

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00185	132S0316	ALL	CAP,CER,X5R,0.1UF,20%,6.3V,01005
132S00350	132S0316	ALL	CAP,CER,X5R,0.1UF,20%,6.3V,01005

PART NUMBER	COMMENT
132S0316	01005,0.1uF, 6.3V

2200pF, 01005

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S00308	132S0420	ALL	CAP,X5R,2200PF,10%,16V,01005,Kyocera
132S00264	132S0420		CAP,CER,X5R,2200PF,10%,16V,01005

PART NUMBER	COMMENT
132S0420	CAP,X5R,2200PF,10%,16V,01005,Taiyo

Apple Proprietary and Confidential

PAGE TITLE

SYSTEM: BOM Tables (1/2) (2)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Misc. Alternates

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
155S00437	155S00402	ALL	FERR BD,33OHM,25%,1.5A,55MOHM DCR,0201
155S00414	155S0876	ALL	FERR BD,10OHM,50%,1.1A,0.05OHM DCR,01005
155S00583	155S00140	ALL	FERR BD,33OHM,25%,400MA,0.20DCR,01005
377S00070	377S00001	ALL	TVS,BIDIR,5.8V,6PF,01005
377S00140	377S00001	ALL	TVS,BIDIR,5V,6PF,01005
155S00700	155S00462	ALL	FLTR,-30DB@0.6-1.55GHZ,1-LINE,ESD,LGA3,ONSEMI
155S00706	155S00462	ALL	FLTR,-30DB@0.6-1.55GHZ,1-LINE,ESD,LGA3,INFINEON
107S00469	107S00349	ALL	THERMISTOR,NTC,10K OHM,1%,B=3380K,01005

PART NUMBER	COMMENT
155S00402	FERR BD,33OHM,25%,1.5A,55MOHM DCR,0201
155S0876	FERR BD,10OHM,50%,1.1A,0.05OHM DCR,01005
155S00140	FERR BD,33OHM,25%,400MA,0.20DCR,01005
377S00001	TVS,BIDIR,5.8V,6PF,01005
155S00462	FLTR,-30DB@0.6-1.55GHZ,1-LINE,ESD,LGA3
107S00349	THERMISTOR,NTC,10KO,1%,B=3380,01005,MUR

Power Inductor Alternates

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
152S01513	152S00897	ALL	IND,CPLD,0.1UH,20%,5.5A,20MO,2016
152S01771	152S00818	ALL	Taiyo,IND,MLD,0.22UH,5.3A,40MO,1608
152S00979	152S00874	ALL	Taiyo,IND,MLD,0.47UH,1.7A,175MO,0402

PART NUMBER	COMMENT
152S00897	Taiyo,IND
152S00818	Cyntec,IND
152S00874	Cyntec.IND

Apple Proprietary and Confidential

PAGE TITLE

SYSTEM: BOM Tables (2/2) (3)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Conventions:

1. All net names and notes should use font size 0.112 (8 if you use the group tool)
2. Nets which are not connected on FFs but probed out on dev board should start with "NC_DEV_"
3. Nets that contain "_1V8" are 1.8V logic, all other nets are implied 1.2V logic
4. Components with PACK_IGNORE=TRUE will not be included in the netlist

TOP SIDE

SH_RF_TXDSM
1
SM
SHLD-MLB-BG-TXDSM-V59
806-45376

BOTTOM SIDE

860-02036
SB0820
STDOFF-2.56OD1.4ID-0.76H-SM
1

806-43270
ST_RF_N_CLIP
STIFFENER-MLB-L-DSM-D3Y
SM
1

ST_RF_E_CLIP
STIFFENER-MLB-LG-D2Y
SM
1
806-33328

860-02278
SB0810
STANDOFF
1

SH_RF_NE
1
SM
SHLD-MLB-BG-NE-V59
806-45377

806-45378
SH_RF_W
1
SM
SHLD-MLB-BG-W-V59

SH_RF_SW
1
SM
SHLD-MLB-BG-SW-V59
806-45379

ST_RF_SE_CLIP
STIFFENER-MLB-D2Y
SM
1
870-16410

FD0900 FID 0P55Q-CROSS-NSP 1
FD0901 FID 0P55Q-CROSS-NSP 1
FD0902 FID 0P55Q-CROSS-NSP 1
FD0903 FID 0P55Q-CROSS-NSP 1
FD0904 FID 0P55Q-CROSS-NSP 1
FD0906 FID 0P55Q-CROSS-NSP 1
FD0907 FID 0P55Q-CROSS-NSP 1
FD0908 FID 0P55Q-CROSS-NSP 1
FD0909 FID 0P55Q-CROSS-NSP 1
998-04808

FD0910 FID 0.75M0.55Q-NSP 1
FD0911 FID 0.75M0.55Q-NSP 1
FD0912 FID 0.75M0.55Q-NSP 1
FD0913 FID 0.75M0.55Q-NSP 1
FD0914 FID 0.75M0.55Q-NSP 1
FD0915 FID 0.75M0.55Q-NSP 1
FD0916 FID 0.75M0.55Q-NSP 1
FD0917 FID 0.75M0.55Q-NSP 1
FD0918 FID 0.75M0.55Q-NSP 1
998-25640

Apple Proprietary and Confidential

PAGE TITLE
SYSTEM: Mechanical (9)

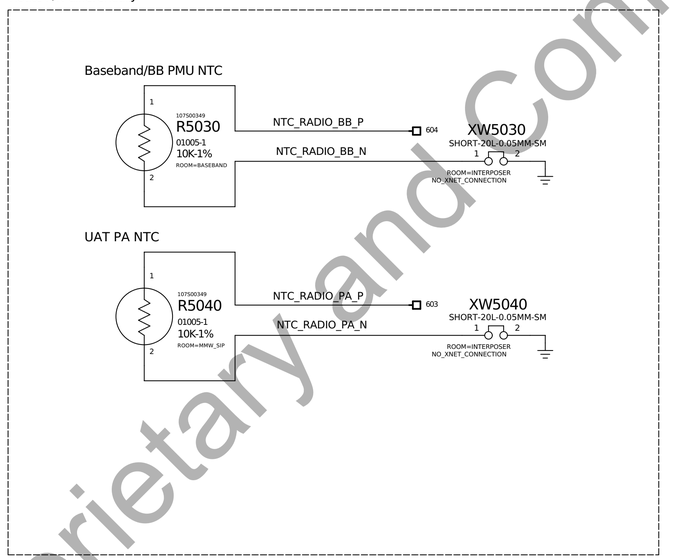
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Bot MLB NTCs

Place NTC XWs near interposer pins for _P nets
Route P/N differentially



Apple Proprietary and Confidential

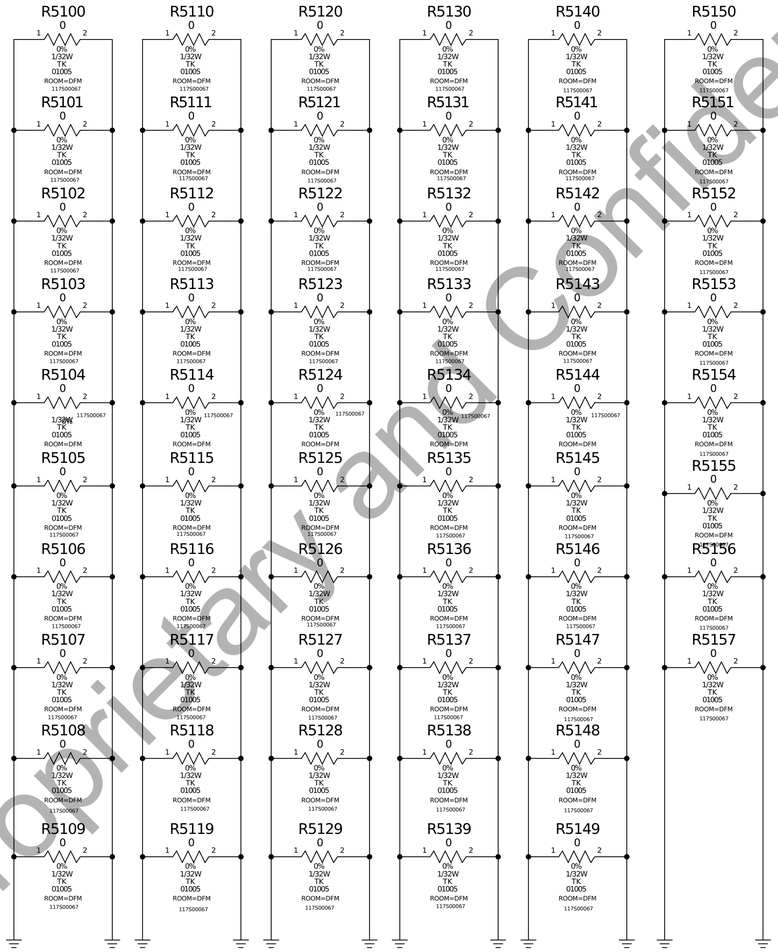
PAGE TITLE
SYS PWR: NTCs (Bottom) (50)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

UF RESISTORS



Apple Proprietary and Confidential

PAGE TITLE

UF DUMMIES (51)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

BOT SPEAKER AMP

Apple Proprietary and Confidential

POWER DOMAIN NOTES:
1. Use S4 domain if possible, then GND VD_FILT_SEL
2. Can use S2 domain if routing constrained, then NC VD_FILT_SEL

PP1V24_S4_LOWER
C8008 0.22UF 10% 6.3V CER-X5R 01005 ROOM=BOT_SPK 130500014
PP1V825_S4_LOWER
C8007 0.22UF 10% 6.3V CER-X5R 01005 ROOM=BOT_SPK 130500014
PP_VA_BOT_SPK_INTERNAL VOLTAGE=1.8 V
C8006 0.22UF 10% 6.3V CER-X5R 01005 ROOM=BOT_SPK AGND_BOT_SPK
PP1V24_S4_LOWER
ANALOG_BOT_SPK_FILT
C8009 1.0UF 20% 6.3V X5R 0201-1 ROOM=BOT_SPK 130500692 NO_XNET_CONNECTION=TRUE AGND_BOT_SPK
I2C2_AOP_SCL
I2C2_AOP_SDA
I2S0_AOP_TO_SPKRAMP_TOP_BOT_ARCAMP_MCLK
I2S0_AOP_TO_SPKRAMP_TOP_BOT_BCLK_R
I2S0_AOP_TO_SPKRAMP_TOP_BOT_DOUT
I2S0_AOP_TO_SPKRAMP_TOP_BOT_LRCLK
I2S0_AOP_FROM_SPKRAMP_TOP_BOT_DIN
VD_FILT_SEL: NC = internal LDO (use if S2 power domain)
GND = external power (use if S4 power domain)
GPIO_S4_PMU_TO_SPKRAMP_BOT_RESET_L
IO_SPKRAMP_TO_SPKRAMP_SYNC
GPIO_S4_BT_TO_BOT_SPKR_TRIG
R8050 100K 5% 1/32W TK 01005 ROOM=BOT_SPK 117500065
AGND_BOT_SPK
XW8000 SHORT-10L-0.1MM-SM ROOM=BOT_SPK NO_XNET_CONNECTION 998-1870
Place off of Allston GNDA pin

U8000 CS35L27A WLCSP

VASP	E7	
VSWIRE	F7	CRITICAL
FILT+	H1	338S00537
PDM1_CLK/SWIRE_CLK	F5	
PDM1_DATA/SWIRE_SD1	F6	
PDM2_CLK	G7	NC
PDM2_DATA	G6	
SWIRE_SD2	F4	
SCL	D5	ROOM=BOT_SPK
SDA	D4	
MCLK	E6	
SCLK	E5	
SDIN	D6	
FSYNC	D7	
SDOUT	E4	
VD_FILT_SEL	C3	
RESET*	H4	
INT*	G4	NC
SYNC	H5	
AD0/GPI	G3	
AD1	G2	
VA	H2	
VL	H6	
VD_FILT	H7	
VP	H3	
VPB	A1, A2, C5, C6, C7	
GNDA	G1	
GNDB	A6, B3, B6, C4	
GNDD	G5, D3	
GNDP	E3, F3	
CF1+	A5, B5	DIDT=TRUE
CF1-	A7, B7	DIDT=TRUE
CF2+	A3, B1, B2	DIDT=TRUE
CF2-	A4, B4	DIDT=TRUE
VBST	C1, C2	
VSPK	D1, E1	
OUT+	E2	
OUT-	D2	
VSNS+	F2	
VSNS-	F1	

Placement Notes:
A1,A2: 15uF (2x), 0.22uF(1x)
C5,C6,C7: 15uF (2x)

PP_VDD_MAIN_5GFEML_ARC_BOT_SPK
C8003 0.22UF 10% 6.3V CER-X5R 01005 ROOM=BOT_SPK 130500014
CRITICAL C8000 15UF 20% 6.3V X5R 0402-1 ROOM=BOT_SPK 138500003
CRITICAL C8001 15UF 20% 6.3V X5R 0402-1 ROOM=BOT_SPK 138500003
CRITICAL C8002 15UF 20% 6.3V X5R 0402-1 ROOM=BOT_SPK 138500003
CRITICAL C8004 15UF 20% 6.3V X5R 0402-1 ROOM=BOT_SPK 138500003

CX_BOTSPK_P1_POS
CX_BOTSPK_P1_NEG
CX_BOTSPK_P2_POS
CX_BOTSPK_P2_NEG
C8031 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071
C8032 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071
C8033 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071
C8034 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071
C8041 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071
C8042 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071
C8043 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071
C8044 4UF 20% 6.3V CER-X5R 0201 ROOM=BOT_SPK 138500071

PP_SPKRAMP_BOT_VBOOST VOLTAGE=13.5 V
CRITICAL C8020 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=BOT_SPK 138500968
CRITICAL C8021 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=BOT_SPK 138500968
CRITICAL C8022 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=BOT_SPK 138500968
C8025 1UF 20% 16V CER-X5R 0201 ROOM=BOT_SPK 138500014
C8023 220PF 5% 25V C0G 01005 ROOM=BOT_SPK 131500543
C8024 2200PF 10% 16V X5R-CERM 01005 ROOM=BOT_SPK 132500420

SPKRAMP_BOT_TO_COIL_OUT_POS
SPKRAMP_BOT_TO_COIL_OUT_NEG
COIL_TO_SPKRAMP_BOT_VSENSE_POS VOLTAGE=13.5 V
COIL_TO_SPKRAMP_BOT_VSENSE_NEG VOLTAGE=13.5 V
C8010 220PF 5% 25V C0G 01005-1 ROOM=BOT_SPK 131500653
C8011 220PF 5% 25V C0G 01005-1 ROOM=BOT_SPK 131500653

PAGE TITLE
AUDIO: Bot Speaker Amp (80)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SPEAKER AMP

PLACEMENT NOTES:
C8308: Place near VD_FILT
C8307: Place near VL
C8306: Place near VA

PP1V2_ARCAMP_VD_FILT_INTERNAL
VOLTAGE=1.2 V

C8308 0.22UF 10% 6.3V CER-X5R 01005 ROOM=ARC 132500014

PP1V8_ARCAMP_VA_VL_INTERNAL
VOLTAGE=1.8 V

C8307 0.22UF 10% 6.3V CER-X5R 01005 ROOM=ARC 132500014

C8306 0.22UF 10% 6.3V CER-X5R 01005 ROOM=ARC 132500014

AGND_ARCAMP

PLACEMENT NOTES:
A1,A2: 15uF (2x), 0.22uF(1x)
C5,C6,C7: 15uF (3x)

C8303 0.22UF 10% 6.3V CER-X5R 01005 ROOM=ARC 132500014

CRITICAL C8300 15UF 20% 6.3V X5R 0402-1 ROOM=ARC 138500003

CRITICAL C8301 15UF 20% 6.3V X5R 0402-1 ROOM=ARC 138500003

CRITICAL C8302 15UF 20% 6.3V X5R 0402-1 ROOM=ARC 138500003

CRITICAL C8304 15UF 20% 6.3V X5R 0402-1 ROOM=ARC 138500003

PP_VDD_MAIN_5GFEML_ARC_BOT_SPK

U8300
CS35L27A
WLCSP

VA VL VD_FILT VP VPB

PP1V2_ARCAMP_VD_FILT_INTERNAL

ANALOG_ARCAMP_FILT

C8309 1.0UF 20% 6.3V X5R 0201-1 ROOM=ARC 13850692

AGND_ARCAMP

NO_XNET_CONNECTION=TRUE

VASP
VSWIRE
FILT+
PDM1_CLK/SWIRE_CLK
PDM1_DATA/SWIRE_SD1
PDM2_CLK
PDM2_DATA
SWIRE_SD2
SCL
SDA
MCLK
SCLK
SDIN
FSYNC
SDOUT
VD_FILT_SEL
RESET*
INT*
SYNC
AD0/GPI
AD1

CRITICAL
338S00537
ROOM=ARC

I2C2_AOP_SCL
I2C2_AOP_SDA
I2S0_AOP_TO_SPKRAMP_TOP_BOT_ARCAMP_MCLK
I2S3_AOP_TO_ARCAMP_CODEC_ASP3_BCLK_R
I2S3_AOP_TO_ARCAMP_CODEC_ASP3_DOUT
I2S3_AOP_TO_ARCAMP_CODEC_ASP3_LRCLK
I2S3_AOP_FROM_ARCAMP_CODEC_ASP3_DIN

VDD_FILT_SEL: NC = Internal VD_FILT LDO

GPIO_S4_PMU_NFC_TO_ARCAMP_RESET_L_1V8
IO_SPKRAMP_TO_SPKRAMP_SYNC
Option to remove SYNC connection
GPIO_S4_PMU_NFC_TO_ARCAMP_TRIG_1V8
PP1V8_ARCAMP_VA_VL_INTERNAL

See # 50911384 for PMU GPIO Pulldown values

CF1+ CF1+ CF1- CF1-
CF2+ CF2+ CF2- CF2-
VBST VBST
VSPK VSPK
OUT+ OUT-
VSNS+ VSNS-

CX_ARCAMP_P1_POS
CX_ARCAMP_P1_NEG
CX_ARCAMP_P2_POS
CX_ARCAMP_P2_NEG
DIDT=TRUE

CRITICAL C8330 15UF 20% 6.3V X5R 0402-1 ROOM=ARC NO_XNET_CONNECTION=TRUE 138500003

C8331 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=ARC NO_XNET_CONNECTION=TRUE 138500450

CRITICAL C8340 15UF 20% 6.3V X5R 0402-1 ROOM=ARC NO_XNET_CONNECTION=TRUE 138500003

C8341 2.2UF 20% 6.3V CER-X5R 0201-1 ROOM=ARC NO_XNET_CONNECTION=TRUE 138500450

ARCAMP_TO_SOLENOID_OUT_POS
ARCAMP_TO_SOLENOID_OUT_NEG
SOLENOID_TO_ARCAMP_VSENSE_POS
SOLENOID_TO_ARCAMP_VSENSE_NEG

VOLTAGE=13.5 V

VOLTAGE=13.5 V
PP_ARCAMP_VBOOST

CRITICAL C8320 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=ARC 138500968

CRITICAL C8321 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=ARC 138500968

CRITICAL C8322 4.2UF 10% 16V X5R-CERM 0402-1 ROOM=ARC 138500968

C8325 1UF 20% 16V CER-X5R 0201 ROOM=ARC 138500014

C8323 220PF 5% 25V CER-C0G 01005 ROOM=ARC 131500543

C8324 2200PF 10% 16V X5R-CERM 01005 ROOM=ARC 131504430

GNDA GNDB GNDD GNDP

XW8300 SHORT-F10L-0.1MM-SM ROOM=ARC NO_XNET_CONNECTION 999-1870

AGND_ARCAMP

Place off of Allston GNDA pin

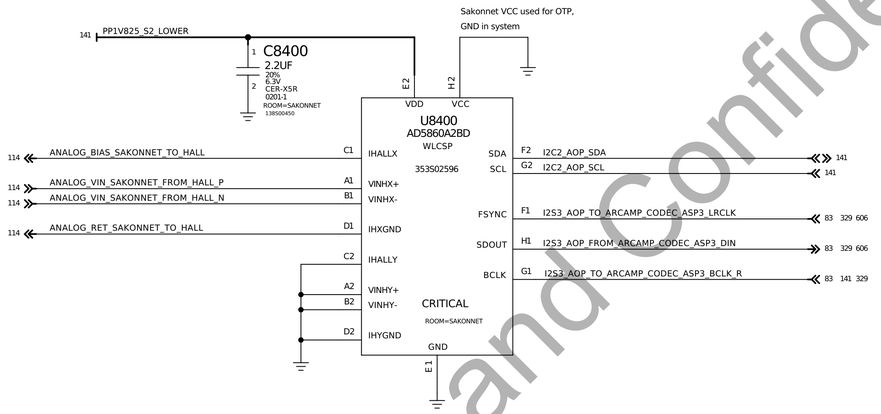
Apple Proprietary and Confidential

PAGE TITLE
HAPTIC: Haptic Amp (83)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

HALL SENSOR



Apple Proprietary and Confidential

PAGE TITLE

HAPTIC: Sakonnet (84)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

BATTERY B2B

CONNECTOR

Apple Proprietary and Confidential

PAGE TITLE

B2B: Battery (104)

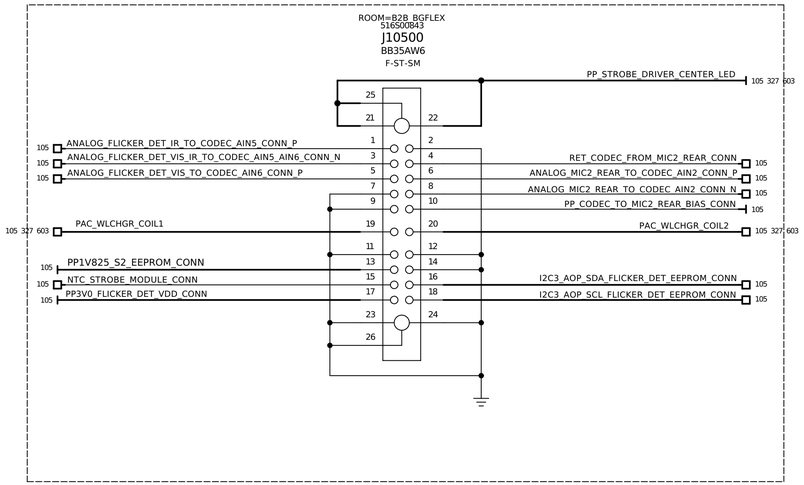
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

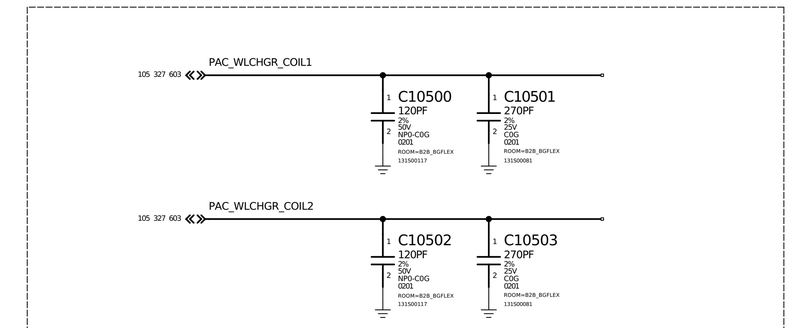
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

BG Flex B2B

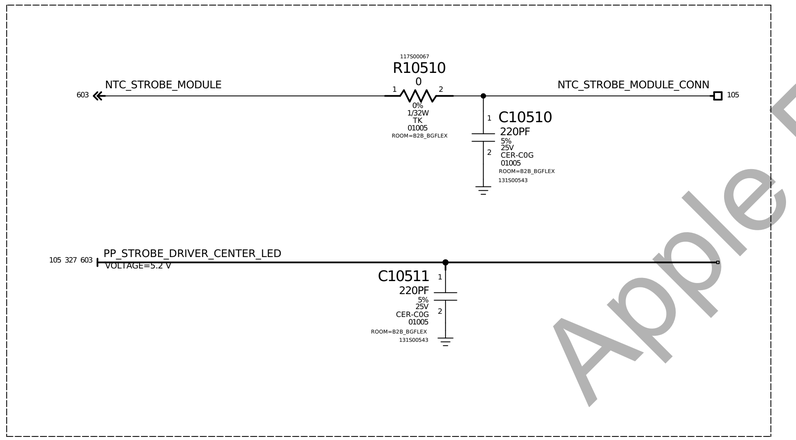
CONNECTOR

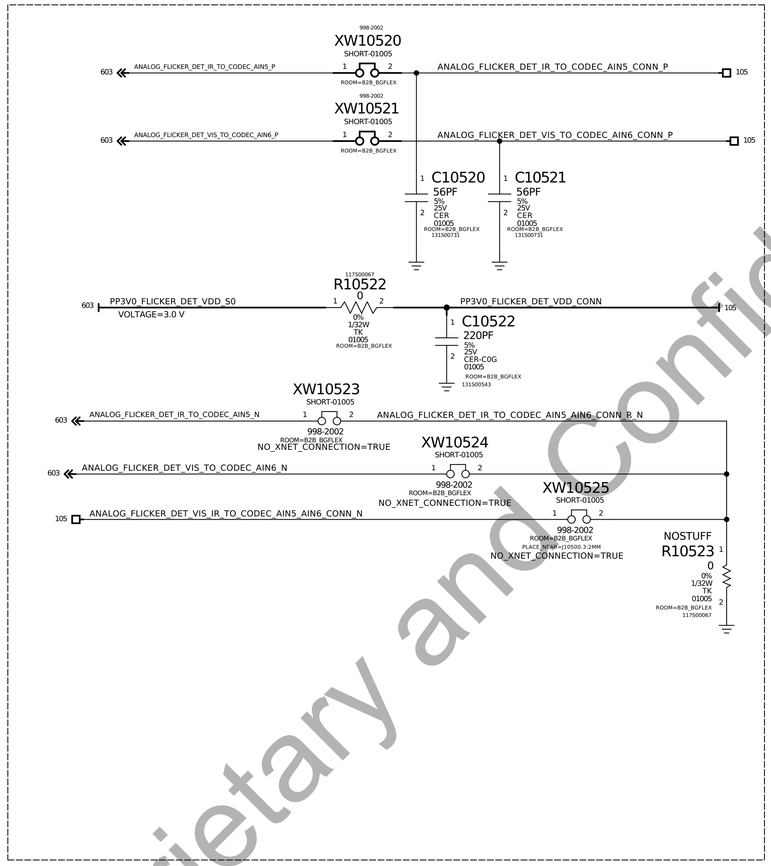


CHROMITE FILTERS

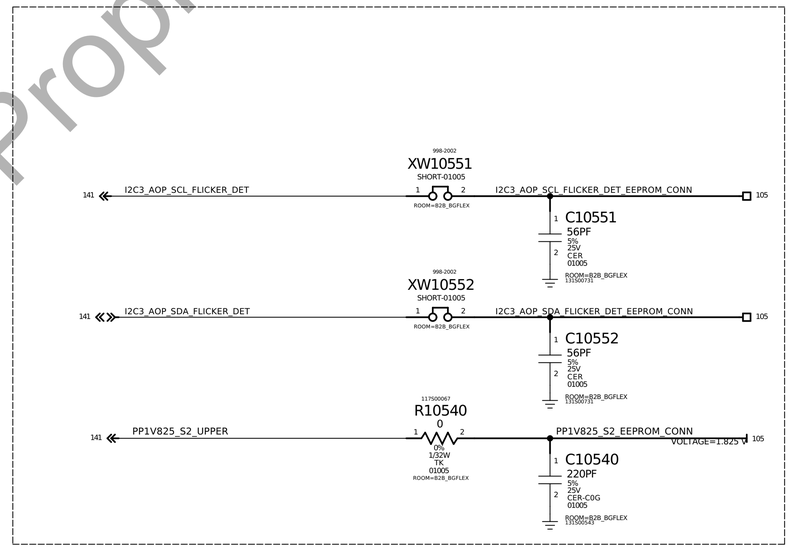


Strobe

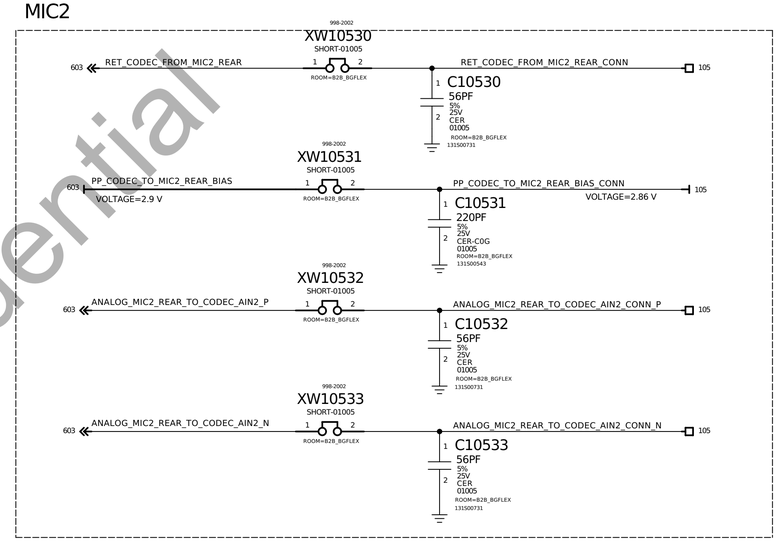




IO FILTERS



MIC2



Apple Proprietary and Confidential

PAGE TITLE

B2B: BG Flex (105)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

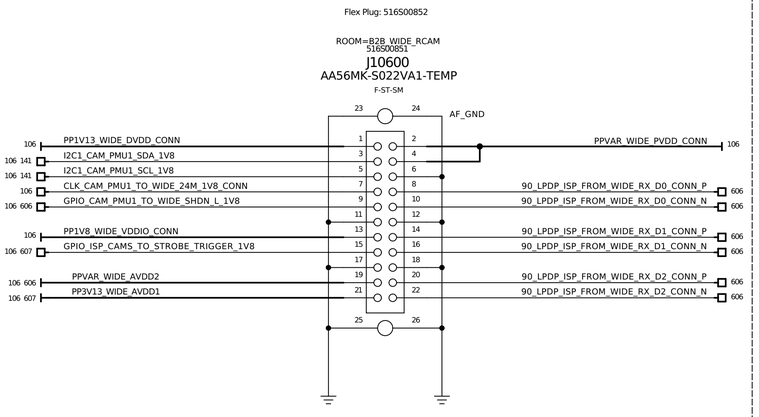
II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

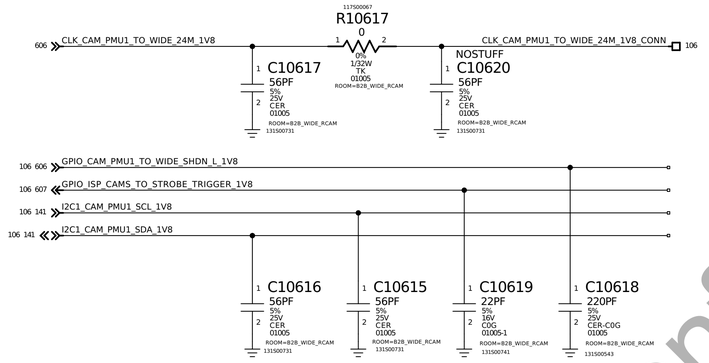
IV ALL RIGHTS RESERVED

WIDE CAMERA B2B

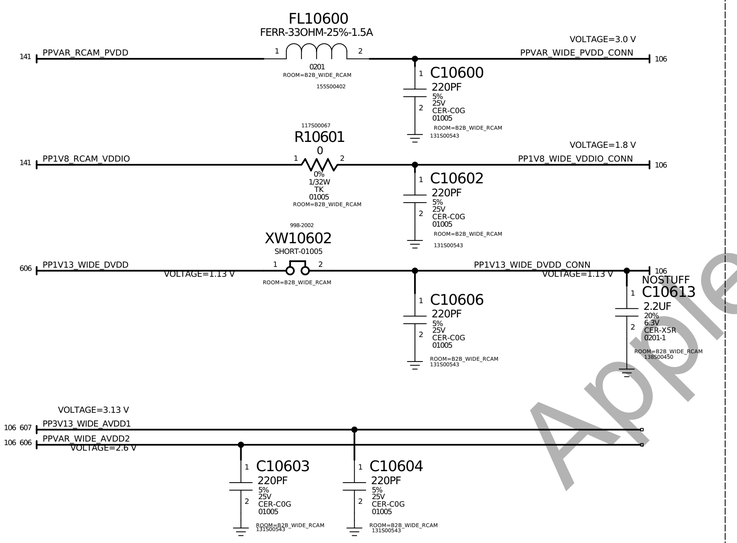
CONNECTOR



IO FILTERS



POWER FILTERS



Apple Proprietary and Confidential

PAGE TITLE

B2B: Camera Wide (106)

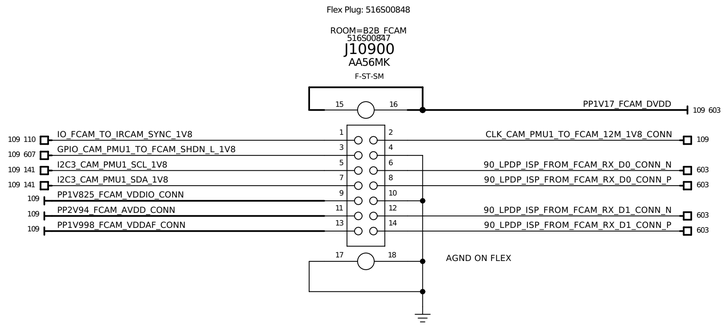
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

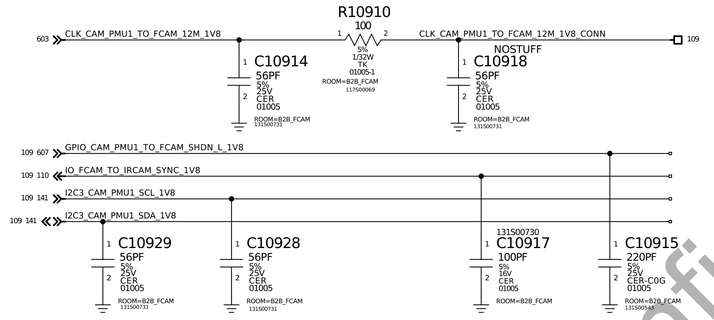
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FCAM B2B

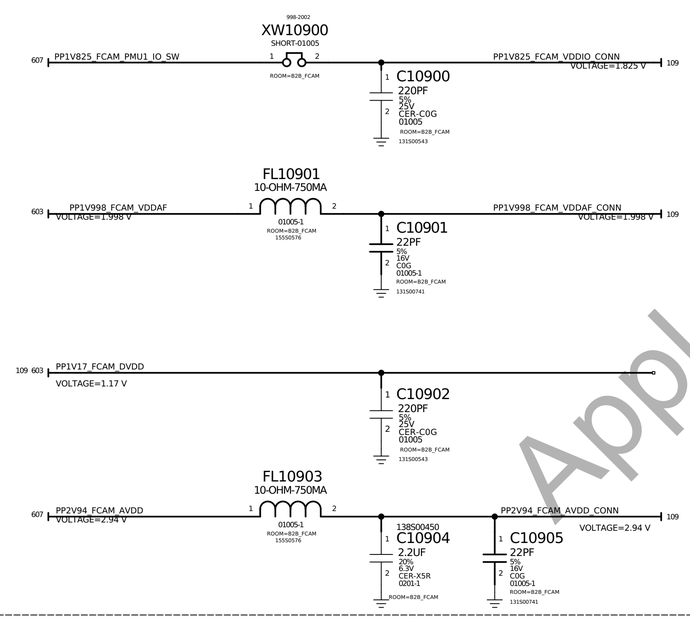
CONNECTORS



IO FILTERS



POWER FILTERS



Apple Proprietary and Confidential

PAGE TITLE

B2B: FCAM (109)

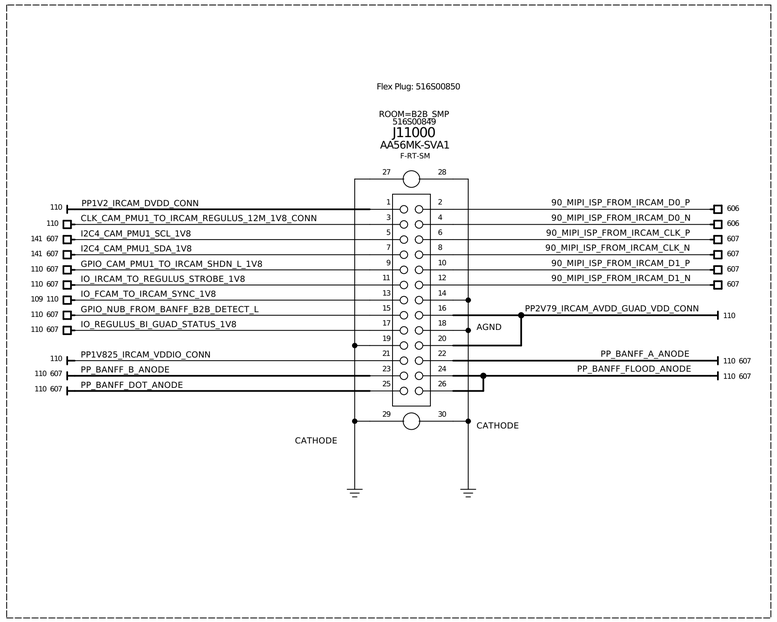
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

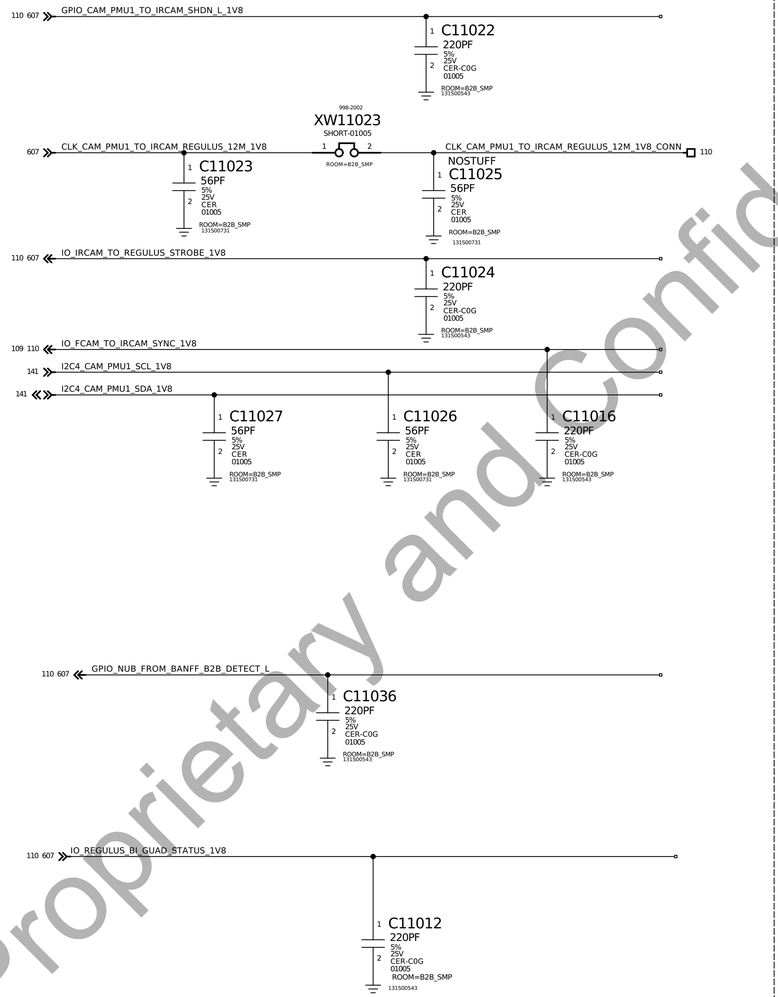
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SMP B2B

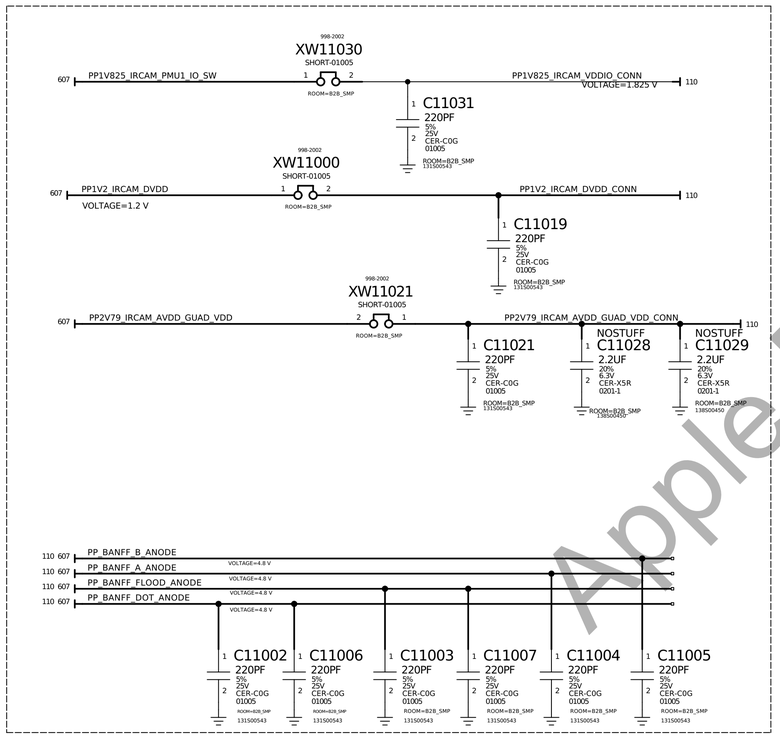
CONNECTOR



IO FILTERS



POWER FILTERS



Apple Proprietary and Confidential

PAGE TITLE

B2B: SMP (110)

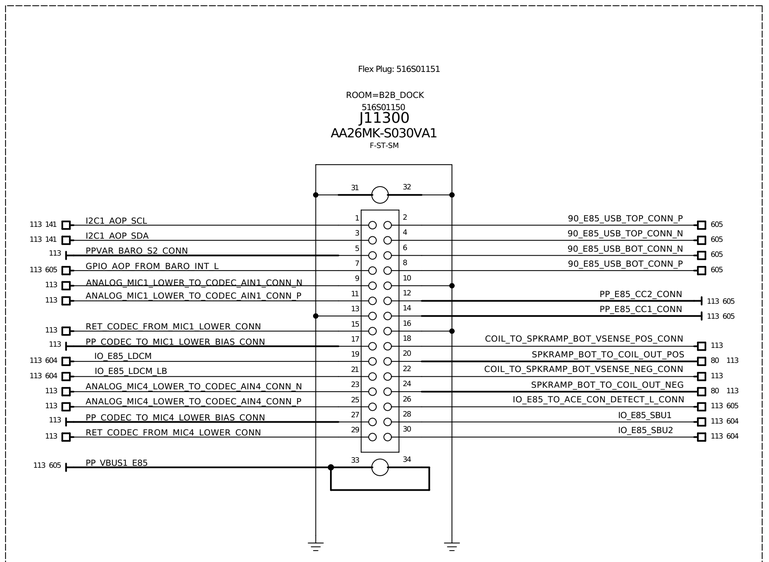
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

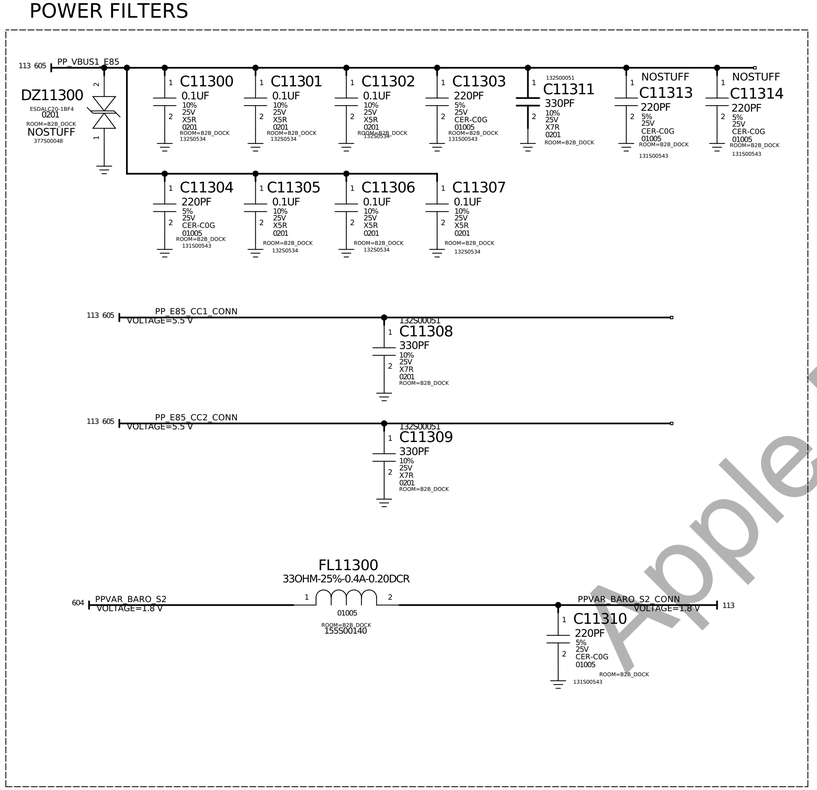
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

DOCK B2B

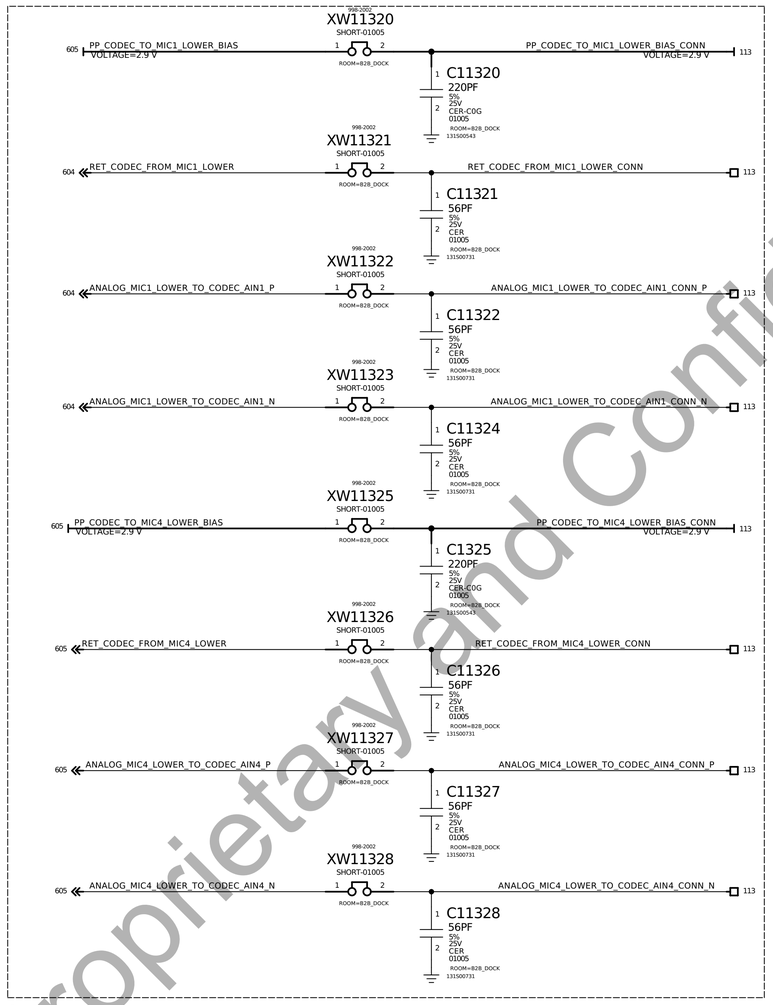
CONNECTOR



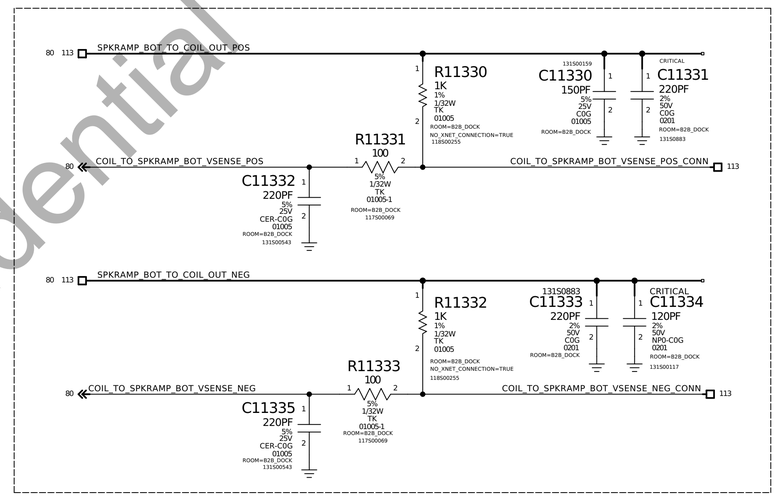
POWER FILTERS



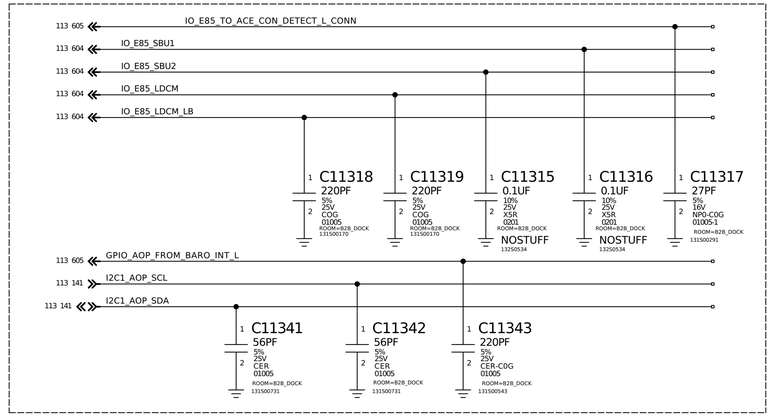
MIC1 + MIC4



BOT SPEAKER


80 113 SPKRAMP_BOT_TO_COIL_OUT_POS
R11330 1K 1% 1/32W TK 01005
C11330 150PF 5% 25V C0G 01005
C11331 220PF 2% 50V C0G 0201
80 COIL_TO_SPKRAMP_BOT_VSENSE_POS
C11332 220PF 5% 25V CER-C0G 01005
R11331 100 5% 1/32W TK 01005-1
COIL_TO_SPKRAMP_BOT_VSENSE_POS_CONN 113
80 113 SPKRAMP_BOT_TO_COIL_OUT_NEG
R11332 1K 1% 1/32W TK 01005
C11333 220PF 2% 50V C0G 0201
C11334 120PF 2% 50V NP0-C0G 0201
80 COIL_TO_SPKRAMP_BOT_VSENSE_NEG
C11335 220PF 5% 25V CER-C0G 01005
R11333 100 5% 1/32W TK 01005-1
COIL_TO_SPKRAMP_BOT_VSENSE_NEG_CONN 113

IO FILTERS



Apple Confidential
Apple Proprietary

PAGE TITLE

B2B: Dock (113)

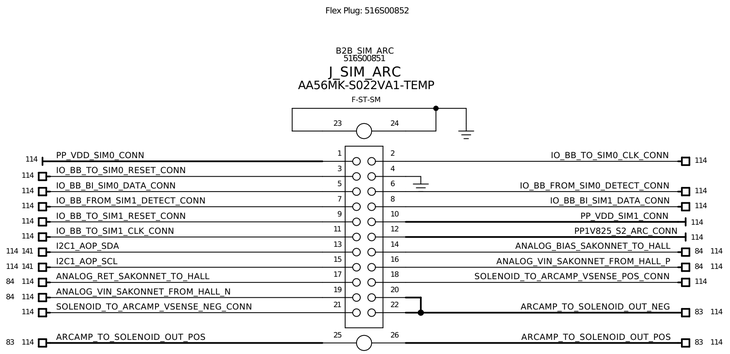
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

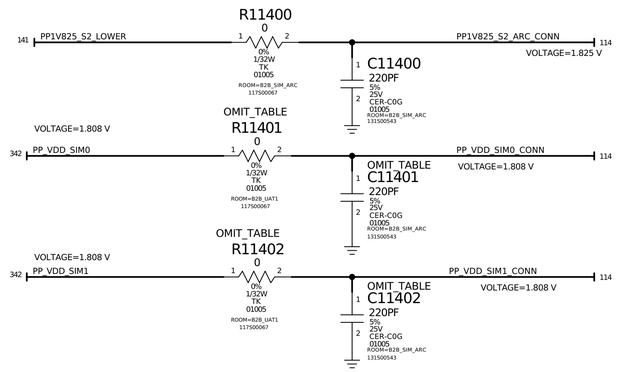
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

SIM ARC B2B

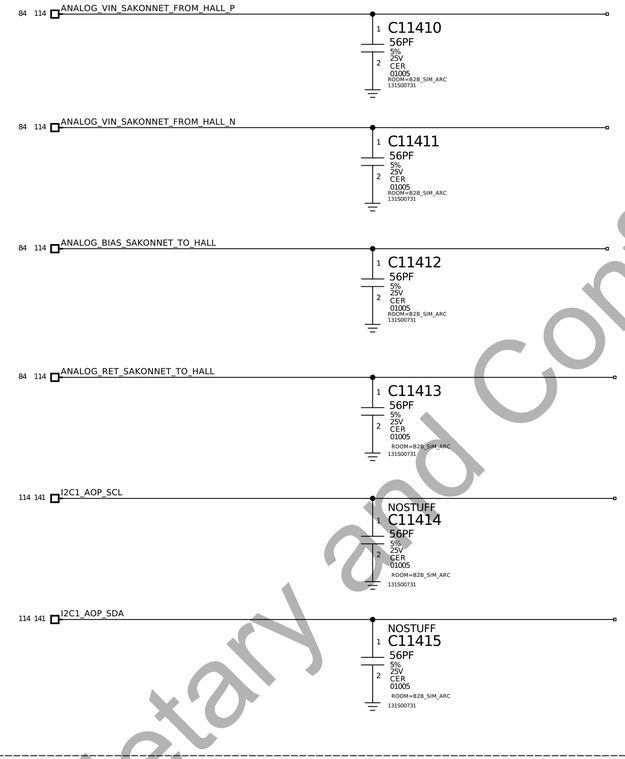
CONNECTOR



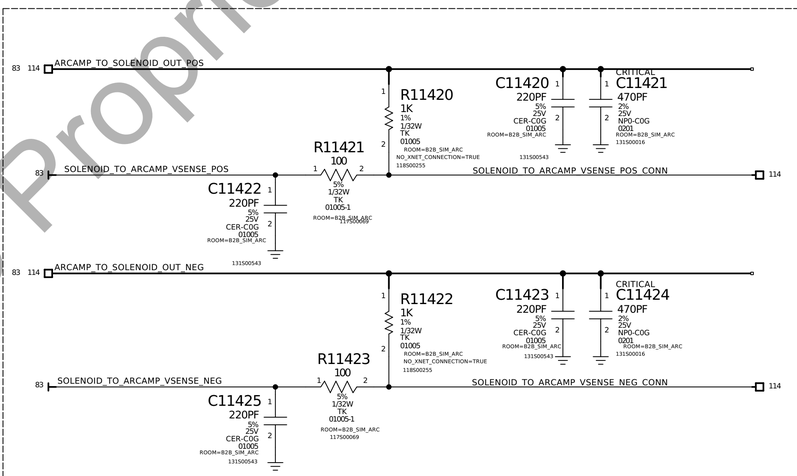
POWER FILTERS



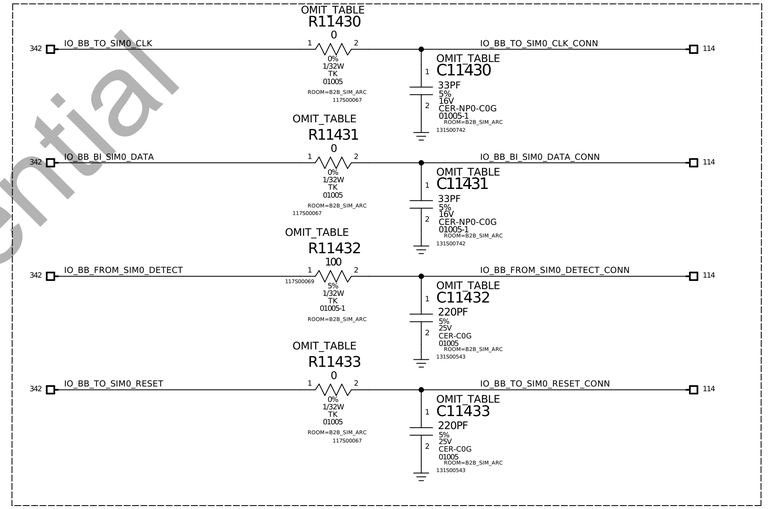
ARC IO FILTERS



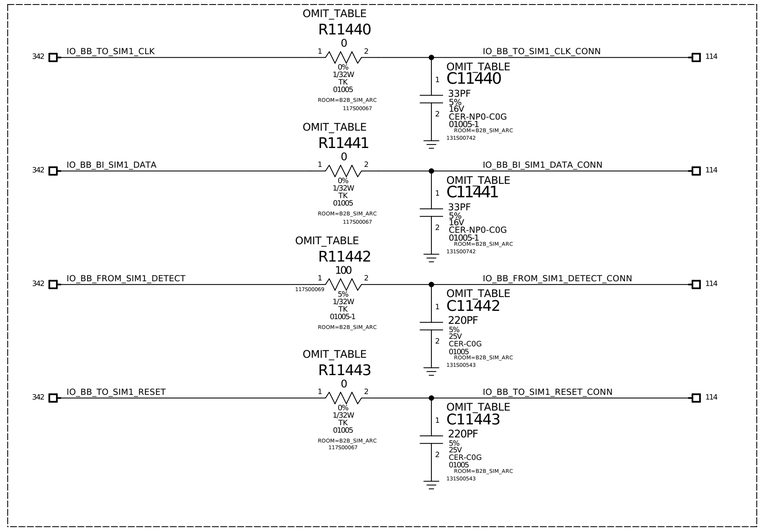
ARC SPEAKER



SIM0 IO FILTERS



SIM1 IO FILTERS



SIM Bus/Power Stuffing Options:

For mmW, Ground flex connections and nostuff series R

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	QTY	DESCRIPTION
117500067	RFSKU:US	C11401,C11402,C11430-C11433,C11440-C11443	10	RES,TK,0 OHM,1/32W,01005
117500067	RFSKU:RS||RFSKU:ROW	C11402,C11440-C11443,R11401,R11430,R11431,R11433	9	RES,TK,0 OHM,1/32W,01005
131500543	RFSKU:RS||RFSKU:ROW	C11401,C11432,C11433	3	CAP,CER,C0G,220PF,5%,25V,01005
117500069	RFSKU:RS||RFSKU:ROW	R11432	1	RES,TK,100 OHM,5%,1/32W,01005
131500742	RFSKU:RS||RFSKU:ROW	C11430,C11431	2	CAP,CER,NP0/C0G,33PF,5%,16V,01005
117500067	RFSKU:CHN	R11401,R11402,R11430,R11431,R11433,R11440,R11441,R11443	8	RES,TK,0 OHM,1/32W,01005
131500543	RFSKU:CHN	C11401,C11402,C11432,C11433,C11442,C11443	6	CAP,CER,C0G,220PF,5%,25V,01005
131500742	RFSKU:CHN	C11430,C11431,C11440,C11441	4	CAP,CER,NP0/C0G,33PF,5%,16V,01005
117500069	RFSKU:CHN	R11432,R11442	2	RES,TK,100 OHM,5%,1/32W,01005

Apple Proprietary and Confidential

PAGE TITLE

B2B: SIM + Arc (114)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

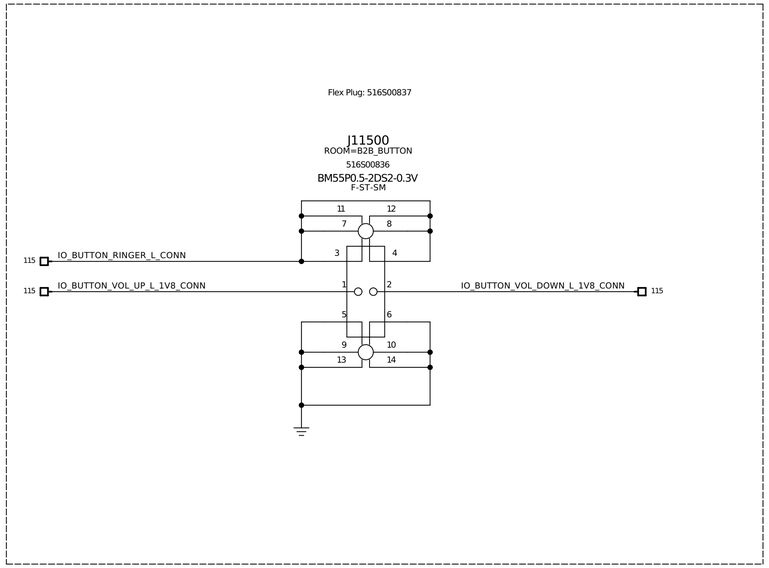
II NOT TO REPRODUCE OR COPY IT

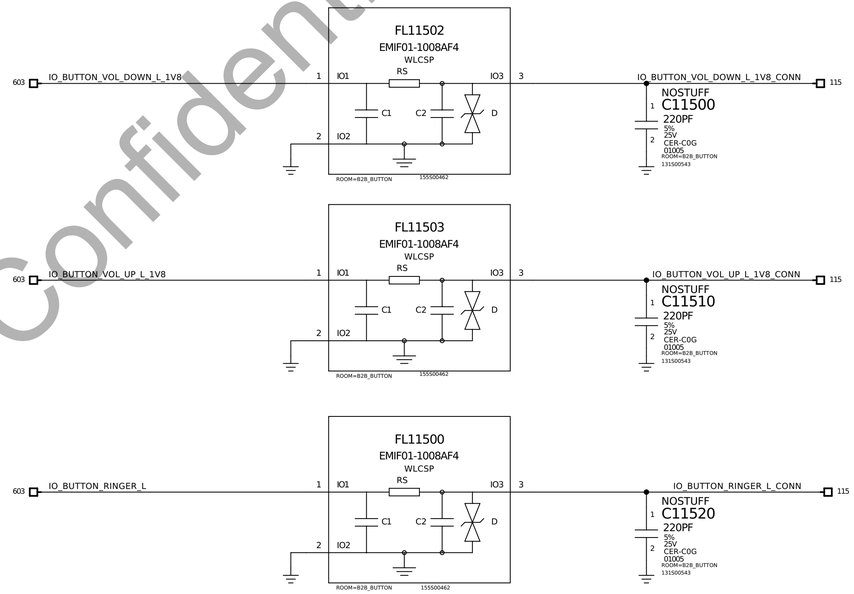
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

Button B2B

CONNECTOR





Apple Proprietary and Confidential

PAGE TITLE

B2B: Button (115)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

UAT1 B2B

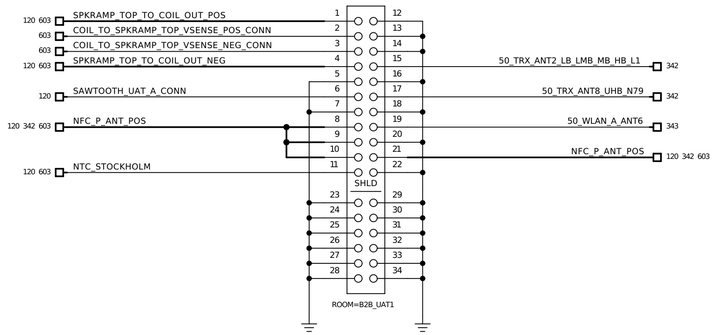
CONNECTOR

UAT1 B2B

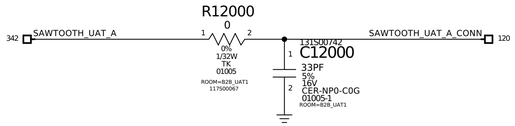
APN 516S00528 <-- ON THE FLEX

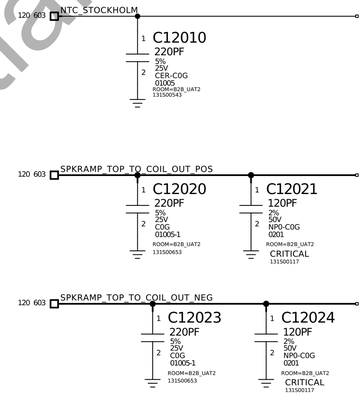
APN 516S00529: ON MLB

516S00529
JUAT1
MM3531-2700A22
F-ST-SM



SUBUS FILTERS





UAT ANTENNAS

ANT2	ANT4	ANT6	ANT8
LB	MB/HB	5GHZ	UHB
LMB/MB/HB	2.4GHZ		SAM
L1 GNSS	UHB		

Apple Proprietary and Confidential

PAGE TITLE
B2B: UAT1 (120)

Apple Inc.

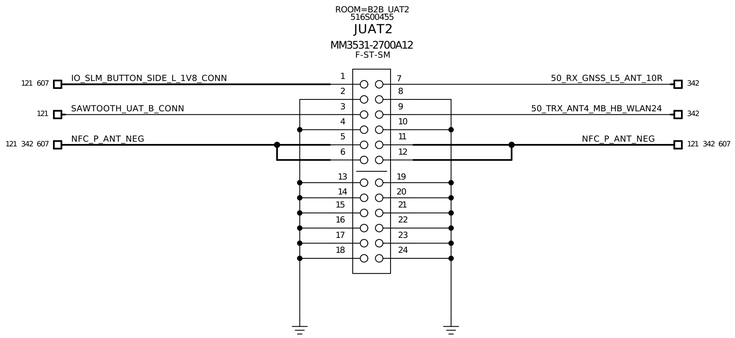
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

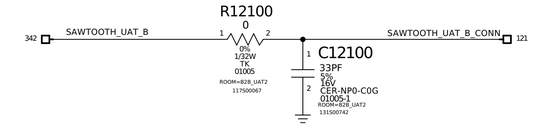
UAT2 B2B

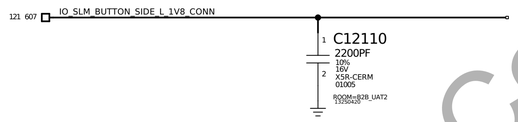
CONNECTOR

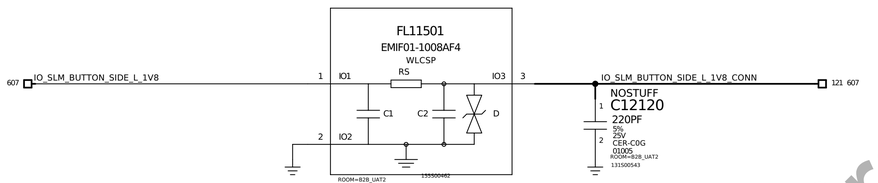
516S00455: RCPT <-- ON MLB
516S00456: PLUG ON FLEX



SUBUS FILTERS







Apple Proprietary and Confidential

PAGE TITLE
B2B: UAT2 (121)

Apple Inc.

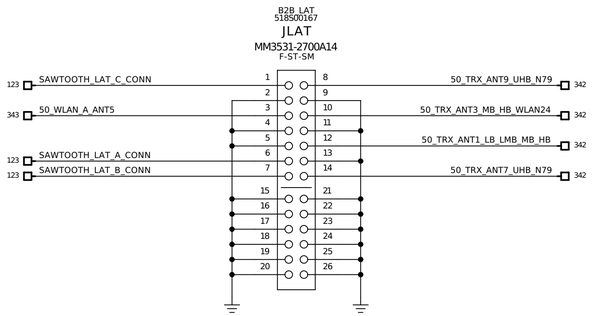
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

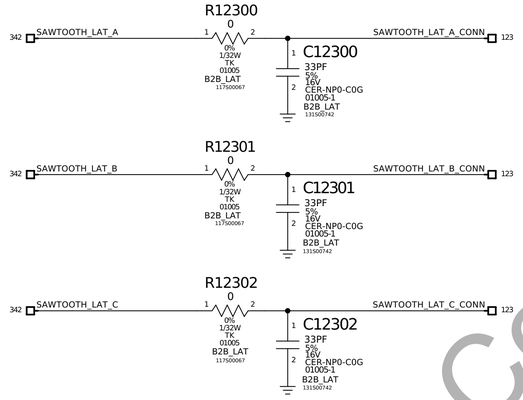
LAT B2B

CONNECTOR

DOCK FLEX: 518S00166



SUBUS FILTERS



Apple Proprietary and Confidential

PAGE TITLE

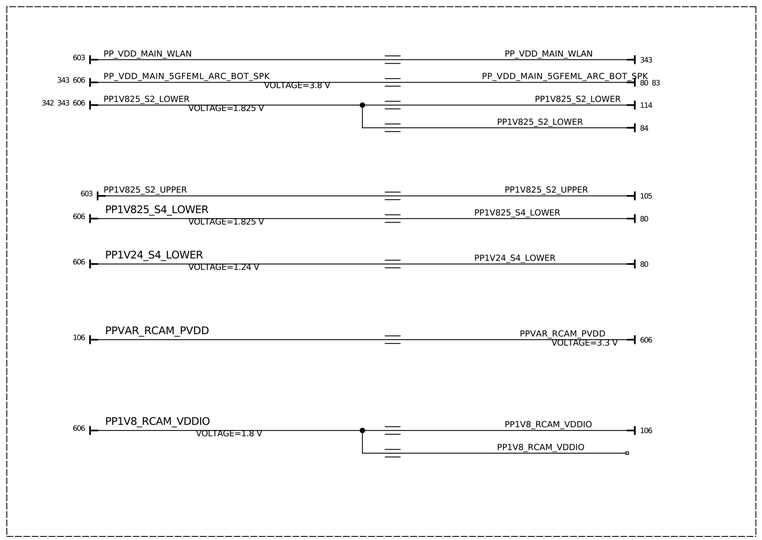
B2B: LAT (123)

Apple Inc.

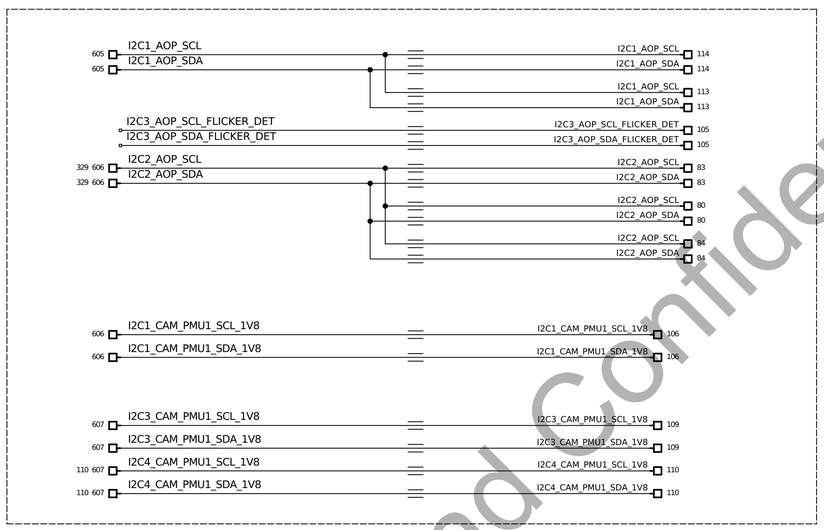
NOTICE OF PROPRIETARY PROPERTY:

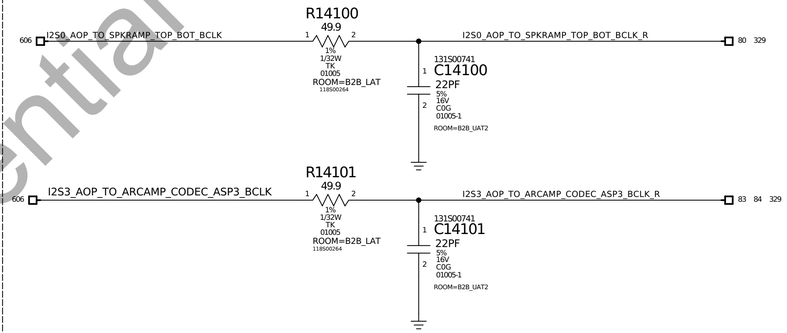
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

POWER

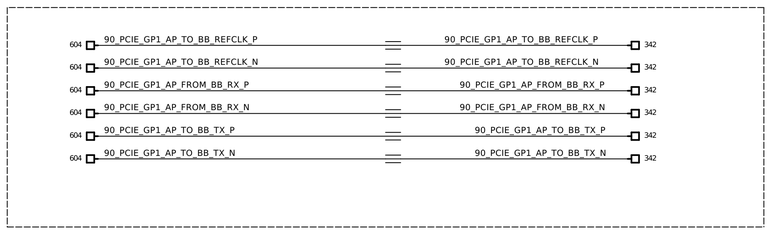


I2C





PCIE



Apple Proprietary and Confidential

PAGE TITLE
SYSTEM: Aliases (141)

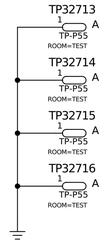
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

BG Test Points

Power + GND



STROBE

Dotara Power

Apple Proprietary and Confidential

PAGE TITLE

TESTING: Test Points (327)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

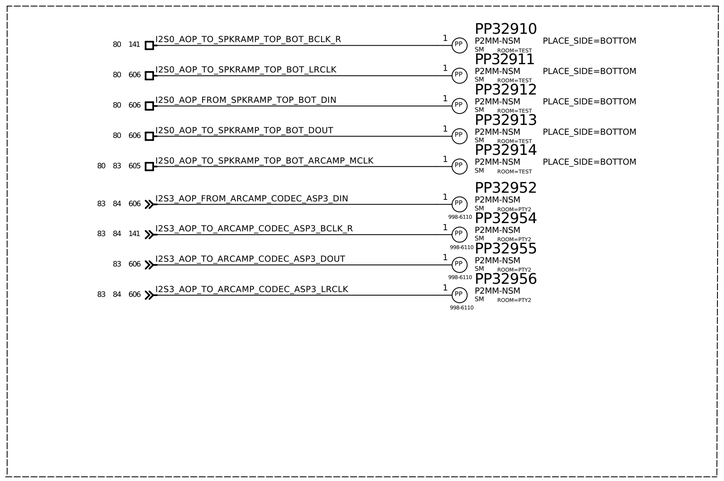
II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

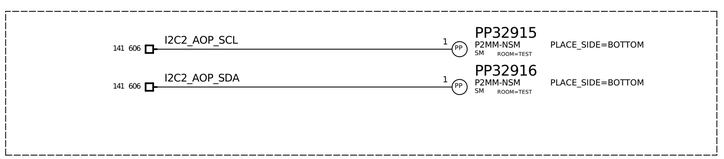
IV ALL RIGHTS RESERVED

BG Probe Points

I2S


80 141 I2S0_AOP_TO_SPKRAMP_TOP_BOT_BCLK_R
PP32910 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM
80 606 I2S0_AOP_TO_SPKRAMP_TOP_BOT_LRCLK
PP32911 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM
80 606 I2S0_AOP_FROM_SPKRAMP_TOP_BOT_DIN
PP32912 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM
80 606 I2S0_AOP_TO_SPKRAMP_TOP_BOT_DOUT
PP32913 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM
80 83 605 I2S0_AOP_TO_SPKRAMP_TOP_BOT_ARCAMP_MCLK
PP32914 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM
83 84 606 I2S3_AOP_FROM_ARCAMP_CODEC_ASP3_DIN
PP32952 P2MM-NSM SM ROOM=PTY2 998-6110
83 84 141 I2S3_AOP_TO_ARCAMP_CODEC_ASP3_BCLK_R
PP32954 P2MM-NSM SM ROOM=PTY2 998-6110
83 606 I2S3_AOP_TO_ARCAMP_CODEC_ASP3_DOUT
PP32955 P2MM-NSM SM ROOM=PTY2 998-6110
83 84 606 I2S3_AOP_TO_ARCAMP_CODEC_ASP3_LRCLK
PP32956 P2MM-NSM SM ROOM=PTY2 998-6110

I2C


141 606 I2C2_AOP_SCL
PP32915 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM
141 606 I2C2_AOP_SDA
PP32916 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM

80 343 GPIO_S4_BT_TO_BOT_SPKR_TRIG
PP32917 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM
343 603 GPIO_AP_FROM_WLAN_TIME_SYNC
PP32918 P2MM-NSM SM ROOM=TEST PLACE_SIDE=BOTTOM

Apple Proprietary and Confidential

PAGE TITLE
TESTING: Probe Points (329)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

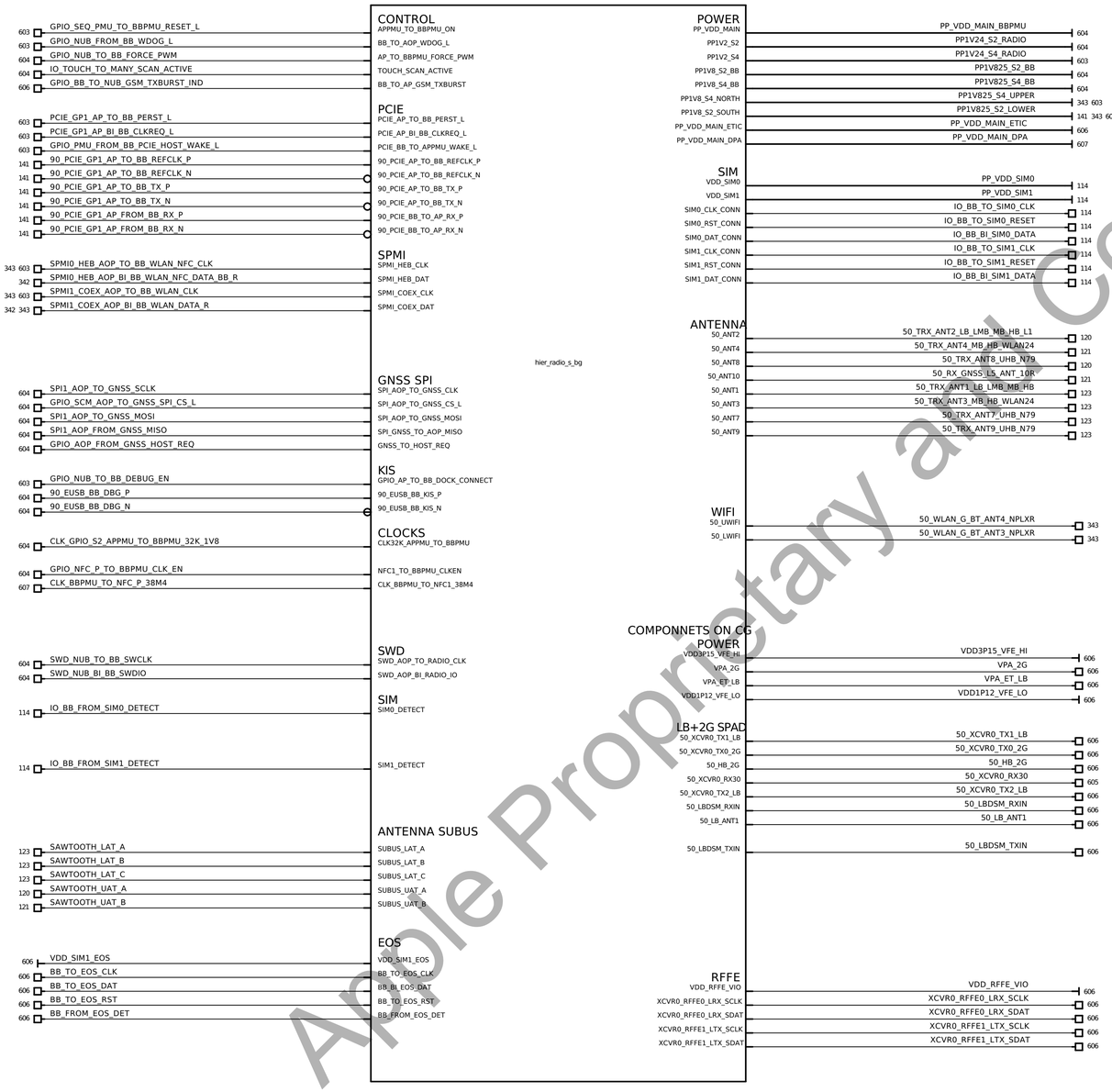
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

HIERARCHIES

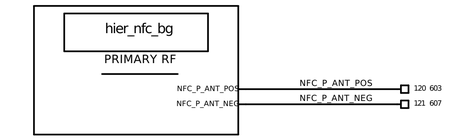
ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
132S0420	132S00264	C2134_C	CAP,CER,X5R,2200PF,10%,,16V,01005
132S00308	132S00264	C2134_C	CAP,X5R,2200PF,10%,,16V,KYO,01005

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S0775	138S0860	C1215_C	CAP,CER,X6S,1UF,10%,25V,0402

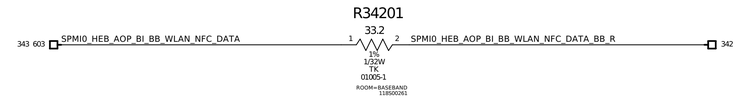
HIER_RADIO_BG



HIER_NFC_BG



TO BASEBAND



For SPMI series resistors, if drivers are close together, only one series resistor is needed.

SYNCING:

PAGE TITLE

HIERARCHIES: BOT: Radio + NFC (342)

Apple Inc.

DRAWING NUMBER D

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

HIERARCHIES

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00109	138S0914	C408_W	CAP,X5R,2.2UF,20%,6.3V,0201,0.35MM,KYO

HIER_WIFI_BG

hier_wifi_bg

POWER

R1

141 PP_VDD_MAIN_WLAN
607 PP_VDD_MAIN_2GFEMU
141 606 PP_VDD_MAIN_5GFEML_ARC_BOT_SPK
603 PP_VDD_MAIN_5GFEMU

PMU

342 343 603 PP1V825_S4_UPPER
606 PP1V24_S4_UPPER
141 342 606 PP1V825_S2_LOWER
342 343 603 PP1V825_S4_UPPER

603 CLK_GPIO_S4_PMU_TO_WLAN_32K
603 GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON
603 GPIO_PMU_FROM_WLAN_HOST_WAKE

PCIE

603 90_PCIE_GP0_AP_FROM_WLAN_RX_P
603 90_PCIE_GP0_AP_FROM_WLAN_RX_N
603 90_PCIE_GP0_AP_TO_WLAN_TX_P
603 90_PCIE_GP0_AP_TO_WLAN_TX_N
603 90_PCIE_GP0_AP_TO_WLAN_REFCLK_P
603 90_PCIE_GP0_AP_TO_WLAN_REFCLK_N
603 PCIE_GP0_AP_TO_WLAN_PERST_L
603 PCIE_GP0_AP_BI_WLAN_CLKREQ_L

SPMI

343 SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA_R
342 603 SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK
342 SPMI1_COEX_AOP_BI_BB_WLAN_DATA_R
342 603 SPMI1_COEX_AOP_TO_BB_WLAN_CLK

PP_VDD_MAIN_WLAN
PP_VDD_MAIN_2GFEMU
PP_VDD_MAIN_5GFEML
PP_VDD_MAIN_5GFEMU

PP1V8_S4_UAT
PP1V2_S4
PP1V8_S2_LAT
PP1V8_S4_WLAN

CLK_GPIO_PMU_TO_WLAN_R1_32K
GPIO_PMU_TO_WLAN_REG_ON
GPIO_PMU_FROM_WLAN_HOST_WAKE

90_PCIE_WLAN_TO_AP_TX_P
90_PCIE_WLAN_TO_AP_TX_N
90_PCIE_AP_TO_WLAN_TX_P
90_PCIE_AP_TO_WLAN_TX_N
90_PCIE_AP_TO_WLAN_REFCLK_P
90_PCIE_AP_TO_WLAN_REFCLK_N
PCIE_AP_TO_WLAN_PERST_1V2_L
PCIE_AP_BI_WLAN_CLKREQ_L

SPMI_EVENTS_AOP_TO_WLAN_NFC_DATA
SPMI_EVENTS_AOP_TO_WLAN_NFC_CLK
WLAN_SPMI_IDC_DATA
WLAN_SPMI_IDC_CLK

SE

I2C_BT_TO_SE_SCL (NO_TEST=TRUE) → I2C_S4_BT_TO_SE_SCL 603
I2C_BT_TO_SE_SDA → I2C_S4_BT_TO_SE_SDA 603
IO_SE_TO_BT_PKT_READY → GPIO_S4_SE_TO_BT_PKT_RDY 603

GPIO

WLAN_TO_AP_TIME_SYNC_1V → GPIO_AP_FROM_WLAN_TIME_SYNC 329 603
BT_TO_AP_AUDIO_SYNC → GPIO_AP_FROM_BT_AUDIO_SYNC 603
BT_TO_BOT_SPK_TRIG → GPIO_S4_BT_TO_BOT_SPKR_TRIG 80 329

UAT 2G PORTS

50_WLAN_G_BT_ANT4_NPLXR → 50_WLAN_G_BT_ANT4_NPLXR 342

UAT 5G PORTS

50_WLAN_A_ANT6 → 50_WLAN_A_ANT6 120

LAT 5G PORTS

50_WLAN_A_ANT5 → 50_WLAN_A_ANT5 123

LAT 2G PORTS

605 50_WLAN_G_C1_TXRX_FEM_M
604 GPIO_WLAN_TO_LAT_2G_FEM_LNA_BYP_EN
604 RFFE_WLAN_TO_LAT_2G_FEM_RST_L
604 SHIELD_RFFE_WLAN_TO_LAT_FEMS_CLK
604 SHIELD_RFFE_WLAN_TO_LAT_FEMS_DATA

50_WLAN_G_C1_TXRX_FEM_M
GPIO_WLAN_TO_LAT_2G_FEM_LNA_BYP_EN
RFFE_WLAN_TO_LAT_2G_FEM_RST_L
SHIELD_RFFE_WLAN_TO_LAT_FEMS_CLK
SHIELD_RFFE_WLAN_TO_LAT_FEMS_DATA

ANALOG_LAT_2G_FEM_TO_WLAN_PDTS → ANALOG_LAT_2G_FEM_TO_WLAN_PDTS 604
50_WLAN_G_BT_LAT → 50_WLAN_G_BT_LAT 606
50_WLAN_G_BT_ANT3_NPLXR → 50_WLAN_G_BT_ANT3_NPLXR 342

R34300
342 603 SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA — 1 — 33.2 1% 1/32W TK 01005-1 ROOM=WLAN 1185O0261 — 2 — SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA_R 343

Apple Proprietary and Confidential

PAGE TITLE
HIERARCHIES: BOT: WiFi (343)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

998-33266

J_INT_BG

INTERPOSER-TOP-BG-V59

SMT-PAD

SYM 1 OF 6

603	GND	1	IO1	91	NTC_RADIO_PA_P	603
603	GND	2	IO2	92	GND	603
603	GND	3	IO3	93	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_N	603
603	GND	4	IO4	94	ANALOG_FLICKER_DET_VIS_TO_CODEC_AIN6_P	603
603	PP1V17_FCAM_DVDD	5	IO5	95	GND	603
603	CLK_CAM_PMU1_TO_FCAM_12M_1V8	6	IO6	96	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_N	603
603	GND	7	IO7	97	ANALOG_FLICKER_DET_IR_TO_CODEC_AIN5_P	603
603	GND	8	IO8	98	GND	603
603	GND	9	IO9	99	ANALOG_MIC2_REAR_TO_CODEC_AIN2_P	603
603	GND	10	IO10	100	ANALOG_MIC2_REAR_TO_CODEC_AIN2_N	603
603	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_P	11	IO11	101	GND	603
603	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_N	12	IO12	102	PP_CODEC_TO_MIC2_REAR_BIAS	603
603	GND	13	IO13	103	RET_CODEC_FROM_MIC2_REAR	603
603	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_N	14	IO14	104	GND	603
603	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_P	15	IO15	105	GND	603
603	GND	16	IO16	106	GND	603
603	GND	17	IO17	107	GND	603
603	GND	18	IO18	108	PP_STROBE_DRIVER_CENTER_LED	603
603	GND	19	IO19	109	PP_STROBE_DRIVER_CENTER_LED	603
603	COIL_TO_SPKRAMP_TOP_VSENSE_POS_CONN	20	IO20	110	GND	603
603	COIL_TO_SPKRAMP_TOP_VSENSE_NEG_CONN	21	IO21	111	I2C3_AOP_SDA_FLICKER_DET	603
603	GND	22	IO22	112	I2C3_AOP_SCL_FLICKER_DET	603
603	SPKRAMP_TOP_TO_COIL_OUT_NEG	23	IO23	113	GND	603
603	SPKRAMP_TOP_TO_COIL_OUT_POS	24	IO24	114	PP1V825_S2_UPPER	603
603	GND	25	IO25	115	PP3V0_FLICKER_DET_VDD_S0	603
603	GND	26	IO26	116	GND	603
603	GND	27	IO27	117	PCIE_GP0_AP_BI_WLAN_CLKREQ_L	603
603	GND	28	IO28	118	NTC_STROBE_MODULE	603
603	NFC_P_ANT_POS	29	IO29	119	GND	603
603	NFC_P_ANT_POS	30	IO30	120	GND	603
603	GND	31	IO31	121	GND	603
603	NFC_P_ANT_POS	32	IO32	122	GND	603
603	GND	33	IO33	123	PAC_WLCHGR_COIL1	603
603	GND	34	IO34	124	PAC_WLCHGR_COIL1	603
603	GND	35	IO35	125	GND	603
603	GND	36	IO36	126	PAC_WLCHGR_COIL2	603
603	GND	37	IO37	127	PAC_WLCHGR_COIL2	603
603	GND	38	IO38	128	GND	603
603	GND	39	IO39	129	GND	603
603	GND	40	IO40	130	GND	603
603	GND	41	IO41	131	GND	603
603	GND	42	IO42	132	90_PCIE_GP0_AP_TO_WLAN_TX_P	603
603	GND	43	IO43	133	90_PCIE_GP0_AP_TO_WLAN_TX_N	603
603	GND	44	IO44	134	GND	603
603	GND	45	IO45	135	90_PCIE_GP0_AP_FROM_WLAN_RX_N	603
603	GND	46	IO46	136	90_PCIE_GP0_AP_FROM_WLAN_RX_P	603
603	GND	47	IO47	137	GND	603
603	GND	48	IO48	138	90_PCIE_GP0_AP_TO_WLAN_REFCLK_P	603
603	GND	49	IO49	139	90_PCIE_GP0_AP_TO_WLAN_REFCLK_N	603
603	GND	50	IO50	140	GND	603
603	GND	51	IO51	141	GND	603
603	GND	52	IO52	142	GND	603
603	GND	53	IO53	143	GND	603
603	GND	54	IO54	144	SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA	603
603	GND	55	IO55	145	SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK	603
603	GND	56	IO56	146	GND	603
603	GND	57	IO57	147	PCIE_GP0_AP_TO_WLAN_PERST_L	603
603	GND	58	IO58	148	GPIO_AP_FROM_WLAN_TIME_SYNC	603
603	GND	59	IO59	149	GND	603
603	NTC_STOCKHOLM	60	IO60	150	CLK_GPIO_S4_PMU_TO_WLAN_32K	603
603	PP1V998_FCAM_VDDAF	61	IO61	151	GPIO_PMU_FROM_WLAN_HOST_WAKE	603
603	GND	62	IO62	152	SPMI1_COEX_AOP_TO_BB_WLAN_CLK	603
603	GND	63	IO63	153	GND	603
603	GND	64	IO64	154	GND	603
603	GND	65	IO65	155	GPIO_S4_SE_TO_BT_PKT_RDY	603
603	GND	66	IO66	156	SPMI1_COEX_AOP_BI_BB_WLAN_DATA	603
603	GND	67	IO67	157	GND	603
603	GPIO_AP_INTERPOSER_CANARY6_A_TO_B	68	IO68	158	I2C_S4_BT_TO_SE_SCL	603
603	GND	69	IO69	159	GND	603
603	GND	70	IO70	160	GND	603
603	GND	71	IO71	161	I2C_S4_BT_TO_SE_SDA	603
603	PP1V24_S4_RADIO	72	IO72	162	GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON	603
603	PP1V825_S4_UPPER	73	IO73	163	PP_VDD_MAIN_WLAN	603
603	GND	74	IO74	164	GND	603
603	GND	75	IO75	165	GPIO_AP_FROM_BT_AUDIO_SYNC	603
603	PP_VDD_MAIN_5GFEMU	76	IO76	166	PP_VDD_MAIN_WLAN	603
603	GND	77	IO77	167	GPIO_AP_INTERPOSER_CANARY7_A_TO_B	603
603	GND	78	IO78	168	GND	603
603	GND	79	IO79	169	GND	603
603	GND	80	IO80	170	GND	603
603	GND	81	IO81	171	GPIO_NUB_TO_BB_DEBUG_EN	603
603	GND	82	IO82	172	GPIO_NUB_FROM_BB_WDOG_L	603
603	GND	83	IO83	173	GND	603
603	IO_BUTTON_RINGER_L	84	IO84	174	GPIO_SEQ_PMU_TO_BBPMU_RESET_L	603
603	IO_BUTTON_VOL_UP_L_1V8	85	IO85	175	GPIO_PMU_FROM_BB_PCIE_HOST_WAKE_L	603
603	GPIO_AP_INTERPOSER_CANARY6_A_TO_B	86	IO86	176	GPIO_AP_INTERPOSER_CANARY7_A_TO_B	603
603	IO_BUTTON_VOL_DOWN_L_1V8	87	IO87	177	PCIE_GP1_AP_TO_BB_PERST_L	603
603	GND	88	IO88	178	GND	603
603	GND	89	IO89	179	PCIE_GP1_AP_BI_BB_CLKREQ_L	603
603	GND	90	IO90	180	GND	603

OMIT

998-33266

J_INT_BG

INTERPOSER-TOP-BG-V59

SMT-PAD

SYM 2 OF 6

604	GND	181	IO181	271	GND	604
604	GND	182	IO182	272	PP_VCC_BATT	604
604	GND	183	IO183	273	PP_VCC_BATT	604
604	GND	184	IO184	274	GND	604
604	SWD_NUB_BI_BB_SWDIO	185	IO185	275	PP_VCC_BATT	604
604	GND	186	IO186	276	PP_VCC_BATT	604
604	SWD_NUB_TO_BB_SWCLK	187	IO187	277	GND	604
604	GND	188	IO188	278	PP_VCC_BATT	604
604	GND	189	IO189	279	PP_VCC_BATT	604
604	GND	190	IO190	280	GND	604
604	90_PCIE_GP1_AP_TO_BB_REFCLK_N	191	IO191	281	PP_VCC_BATT	604
604	GND	192	IO192	282	PP_VCC_BATT	604
604	90_PCIE_GP1_AP_TO_BB_REFCLK_P	193	IO193	283	GND	604
604	GND	194	IO194	284	PP_VCC_BATT	604
604	90_PCIE_GP1_AP_TO_BB_TX_P	195	IO195	285	GND	604
604	GND	196	IO196	286	GND	604
604	90_PCIE_GP1_AP_TO_BB_TX_N	197	IO197	287	GND	604
604	GND	198	IO198	288	ANALOG_LAT_2G_FEM_TO_WLAN_PDTS	604
604	90_PCIE_GP1_AP_FROM_BB_RX_N	199	IO199	289	GND	604
604	GND	200	IO200	290	GND	604
604	90_PCIE_GP1_AP_FROM_BB_RX_P	201	IO201	291	RFFE_WLAN_TO_LAT_2G_FEM_RST_L	604
604	GND	202	IO202	292	GND	604
604	GND	203	IO203	293	GND	604
604	GND	204	IO204	294	GND	604
604	90_EUSB_BB_DBG_N	205	IO205	295	GND	604
604	GND	206	IO206	296	GPIO_AP_INTERPOSER_CANARY9_A_TO_B	604
604	90_EUSB_BB_DBG_P	207	IO207	297	GPIO_AP_INTERPOSER_CANARY9_A_TO_B	604
604	GND	208	IO208	298	GND	604
604	GND	209	IO209	299	GND	604
604	GND	210	IO210	300	GND	604
604	GND	211	IO211	301	GPIO_AP_INTERPOSER_CANARY9_C_TO_D	604
604	GND	212	IO212	302	GND	604
604	PP_VDD_MAIN_BBPMU	213	IO213	303	GND	604
604	GND	214	IO214	304	GND	604
604	PP_VDD_MAIN_BBPMU	215	IO215	305	GPIO_AP_INTERPOSER_CANARY9_C_TO_D	604
604	GND	216	IO216	306	GND	604
604	PP_VDD_MAIN_BBPMU	217	IO217	307	GND	604
604	GND	218	IO218	308	GND	604
604	PP_VDD_MAIN_BBPMU	219	IO219	309	GND	604
604	GND	220	IO220	310	GND	604
604	PP_VDD_MAIN_BBPMU	221	IO221	311	GND	604
604	GND	222	IO222	312	GND	604
604	GND	223	IO223	313	IO_E85_LDCM	604
604	GND	224	IO224	314	GND	604
604	GND	225	IO225	315	GND	604
604	GND	226	IO226	316	IO_E85_LDCM_LB	604
604	PP1V825_S4_BB	227	IO227	317	GND	604
604	GND	228	IO228	318	GND	604
604	IO_TOUCH_TO_MANY_SCAN_ACTIVE	229	IO229	319	IO_E85_SBU2	604
604	GND	230	IO230	320	GND	604
604	GPIO_NUB_TO_BB_FORCE_PWM	231	IO231	321	GND	604
604	GND	232	IO232	322	IO_E85_SBU1	604
604	GND	233	IO233	323	GND	604
604	GND	234	IO234	324	PP1V24_S2_RADIO	604
604	CLK_GPIO_S2_APPMU_TO_BBPMU_32K_1V8	235	IO235	325	GND	604
604	GND	236	IO236	326	GPIO_WLAN_TO_LAT_2G_FEM_LNA_BYP_EN	604
604	GND	237	IO237	327	GND	604
604	GND	238	IO238	328	GND	604
604	GPIO_NFC_P_TO_BBPMU_CLK_EN	239	IO239	329	GND	604
604	GND	240	IO240	330	GND	604
604	NTC_RADIO_BB_P	241	IO241	331	GND	604
604	GND	242	IO242	332	GND	604
604	PP1V825_S2_BB	243	IO243	333	GND	604
604	GND	244	IO244	334	GND	604
604	GPIO_AP_INTERPOSER_CANARY8_A_TO_B	245	IO245	335	GND	604
604	GND	246	IO246	336	GND	604
604	GND	247	IO247	337	GND	604
604	GND	248	IO248	338	GND	604
604	GND	249	IO249	339	GND	604
604	GPIO_AP_INTERPOSER_CANARY8_A_TO_B	250	IO250	340	GND	604
604	SHIELD_RFFE_WLAN_TO_LAT_FEMS_CLK	251	IO251	341	GND	604
604	SHIELD_RFFE_WLAN_TO_LAT_FEMS_DATA	252	IO252	342	GND	604
604	GND	253	IO253	343	GND	604
604	GPIO_AOP_FROM_GNSS_HOST_REQ	254	IO254	344	GND	604
604	GND	255	IO255	345	GND	604
604	GND	256	IO256	346	GND	604
604	GPIO_SCM_AOP_TO_GNSS_SPI_CS_L	257	IO257	347	GND	604
604	SPI1_AOP_TO_GNSS_SCLK	258	IO258	348	GND	604
604	GND	259	IO259	349	GND	604
604	SPI1_AOP_FROM_GNSS_MISO	260	IO260	350	GND	604
604	SPI1_AOP_TO_GNSS_MOSI	261	IO261	351	GND	604
604	GND	262	IO262	352	GND	604
604	GND	263	IO263	353	PPVAR_BARO_S2	604
604	GND	264	IO264	354	GND	604
604	GND	265	IO265	355	ANALOG_MIC1_LOWER_TO_CODEC_AIN1_P	604
604	I2C2_SMC_CHARGER_TO_GG_SCL_1V8_CONN	266	IO266	356	GND	604
604	I2C2_SMC_CHARGER_BI_GG_SDA_1V8	267	IO267	357	ANALOG_MIC1_LOWER_TO_CODEC_AIN1_N	604
604	GND	268	IO268	358	GND	604
604	GND	269	IO269	359	RET_CODEC_FROM_MIC1_LOWER	604
604	GND	270	IO270	360	GND	604

OMIT

Apple Proprietary and Confidential

PAGE TITLE

Interposer: BG (1/3) (600)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

998-33266

J_INT_BG

INTERPOSER-TOP-BG-V59

SMT-PAD

SYM 3 OF 6

605	PP_CODEC_TO_MIC1_LOWER_BIAS	361	IO361	IO451	451	GND
605	GND	362	IO362	IO452	452	GND
605	GND	363	IO363	IO453	453	GND
605	GND	364	IO364	IO454	454	GND
605	90_E85_USB_BOT_CONN_P	365	IO365	IO455	455	GND
605	GND	366	IO366	IO456	456	GND
605	90_E85_USB_BOT_CONN_N	367	IO367	IO457	457	GND
605	GND	368	IO368	IO458	458	GND
605	90_E85_USB_TOP_CONN_N	369	IO369	IO459	459	GND
605	GND	370	IO370	IO460	460	GND
605	90_E85_USB_TOP_CONN_P	371	IO371	IO461	461	GND
605	GND	372	IO372	IO462	462	GND
605	GND	373	IO373	IO463	463	GND
605	GND	374	IO374	IO464	464	GND
605	GND	375	IO375	IO465	465	50_WLAN_G_C1_TXRX_FEM_M
605	GND	376	IO376	IO466	466	GND
605	GND	377	IO377	IO467	467	GND
605	PP_E85_CC1_CONN	378	IO378	IO468	468	GND
605	GND	379	IO379	IO469	469	50_XCVR0_RX30
605	PP_E85_CC2_CONN	380	IO380	IO470	470	GND
605	GND	381	IO381	IO471	471	GND
605	GND	382	IO382	IO472	472	GND
605	GND	383	IO383	IO473	473	GND
605	IO_E85_TO_ACE_CON_DETECT_L_CONN	384	IO384	IO474	474	GND
605	GND	385	IO385	IO475	475	GND
605	GPIO_AOP_FROM_BARO_INT_L	386	IO386	IO476	476	GND
605	GND	387	IO387	IO477	477	GND
605	I2C1_AOP_SCL	388	IO388	IO478	478	GND
605	GND	389	IO389	IO479	479	GND
605	I2C1_AOP_SDA	390	IO390	IO480	480	GND
605	GND	391	IO391	IO481	481	GND
605	GND	392	IO392	IO482	482	GND
605	GND	393	IO393	IO483	483	GND
605	GND	394	IO394	IO484	484	GND
605	GND	395	IO395	IO485	485	GND
605	PP_VBUS1_E85	396	IO396	IO486	486	GND
605	PP_VBUS1_E85	397	IO397	IO487	487	GND
605	GND	398	IO398	IO488	488	GND
605	PP_VBUS1_E85	399	IO399	IO489	489	GND
605	PP_VBUS1_E85	400	IO400	IO490	490	GND
605	GND	401	IO401	IO491	491	GND
605	PP_VBUS1_E85	402	IO402	IO492	492	GND
605	PP_VBUS1_E85	403	IO403	IO493	493	GND
605	GND	404	IO404	IO494	494	GND
605	GND	405	IO405	IO495	495	GND
605	GND	406	IO406	IO496	496	GND
605	GND	407	IO407	IO497	497	GND
605	GND	408	IO408	IO498	498	GND
605	GND	409	IO409	IO499	499	GND
605	GND	410	IO410	IO500	500	GND
605	GND	411	IO411	IO501	501	GND
605	GND	412	IO412	IO502	502	GND
605	GND	413	IO413	IO503	503	GND
605	GND	414	IO414	IO504	504	GND
605	GND	415	IO415	IO505	505	GND
605	GND	416	IO416	IO506	506	GND
605	GND	417	IO417	IO507	507	GND
605	GND	418	IO418	IO508	508	GND
605	GND	419	IO419	IO509	509	GND
605	GND	420	IO420	IO510	510	GND
605	GPIO_AP_INTERPOSER_CANARY10_A_TO_B	421	IO421	IO511	511	GND
605	GND	422	IO422	IO512	512	GND
605	GND	423	IO423	IO513	513	GND
605	GND	424	IO424	IO514	514	GND
605	GND	425	IO425	IO515	515	GND
605	GND	426	IO426	IO516	516	GND
605	GND	427	IO427	IO517	517	GND
605	RET_CODEC_FROM_MIC4_LOWER	428	IO428	IO518	518	GND
605	GPIO_AP_INTERPOSER_CANARY10_A_TO_B	429	IO429	IO519	519	GND
605	PP_CODEC_TO_MIC4_LOWER_BIAS	430	IO430	IO520	520	GND
605	GND	431	IO431	IO521	521	GND
605	ANALOG_MIC4_LOWER_TO_CODEC_AIN4_N	432	IO432	IO522	522	GND
605	GND	433	IO433	IO523	523	GND
605	ANALOG_MIC4_LOWER_TO_CODEC_AIN4_P	434	IO434	IO524	524	GND
605	GND	435	IO435	IO525	525	GND
605	GND	436	IO436	IO526	526	GND
605	GND	437	IO437	IO527	527	GND
605	GPIO_S4_PMU_TO_SPKRAMP_BOT_RESET_L	438	IO438	IO528	528	GND
605	GND	439	IO439	IO529	529	GND
605	IO_SPKRAMP_TO_SPKRAMP_SYNC	440	IO440	IO530	530	GND
605	GND	441	IO441	IO531	531	GND
605	GPIO_S4_PMU_NFC_TO_ARCAMP_RESET_L_1V8	442	IO442	IO532	532	GND
605	GND	443	IO443	IO533	533	GND
605	GPIO_S4_PMU_NFC_TO_ARCAMP_TRIG_1V8	444	IO444	IO534	534	GND
605	GND	445	IO445	IO535	535	GND
605	GND	446	IO446	IO536	536	GND
605	GND	447	IO447	IO537	537	GND
605	I2S0_AOP_TO_SPKRAMP_TOP_BOT_ARCAMP_MCLK	448	IO448	IO538	538	GND
605	GND	449	IO449	IO539	539	GND
605	GND	450	IO450	IO540	540	GND

OMIT

998-33266

J_INT_BG

INTERPOSER-TOP-BG-V59

SMT-PAD

SYM 4 OF 6

606	GND	541	IO541	IO631	631	PP_VDD_MAIN_ETIC
606	GND	542	IO542	IO632	632	PP_VDD_MAIN_ETIC
606	GND	543	IO543	IO633	633	PP_VDD_MAIN_ETIC
606	GND	544	IO544	IO634	634	GND
606	GND	545	IO545	IO635	635	GND
606	GND	546	IO546	IO636	636	XCVR0_RFFE1_LTX_SDAT
606	GND	547	IO547	IO637	637	XCVR0_RFFE1_LTX_SCLK
606	GND	548	IO548	IO638	638	GND
606	GND	549	IO549	IO639	639	GND
606	GND	550	IO550	IO640	640	VPA_ET_LB
606	GND	551	IO551	IO641	641	VPA_ET_LB
606	GND	552	IO552	IO642	642	GND
606	GND	553	IO553	IO643	643	GND
606	GND	554	IO554	IO644	644	VPA_2G
606	GND	555	IO555	IO645	645	VPA_2G
606	GND	556	IO556	IO646	646	GND
606	GND	557	IO557	IO647	647	GND
606	GND	558	IO558	IO648	648	GND
606	GND	559	IO559	IO649	649	GND
606	GND	560	IO560	IO650	650	VDD3P15_VFE_HI
606	GND	561	IO561	IO651	651	GND
606	GND	562	IO562	IO652	652	GND
606	50_WLAN_G_BT_LAT	563	IO563	IO653	653	GND
606	GND	564	IO564	IO654	654	GND
606	GND	565	IO565	IO655	655	GND
606	GND	566	IO566	IO656	656	GPIO_AP_INTERPOSER_CANARY11_C_TO_D
606	VDD_SIM1_EOS	567	IO567	IO657	657	GND
606	BB_TO_EOS_CLK	568	IO568	IO658	658	GPIO_AP_INTERPOSER_CANARY11_C_TO_D
606	GND	569	IO569	IO659	659	GND
606	BB_TO_EOS_DAT	570	IO570	IO660	660	GPIO_AP_INTERPOSER_CANARY11_A_TO_B
606	BB_TO_EOS_RST	571	IO571	IO661	661	GND
606	BB_FROM_EOS_DET	572	IO572	IO662	662	GPIO_AP_INTERPOSER_CANARY11_A_TO_B
606	PP1V825_S2_LOWER	573	IO573	IO663	663	GND
606	PP1V24_S4_LOWER	574	IO574	IO664	664	GND
606	GND	575	IO575	IO665	665	GND
606	PP1V825_S4_LOWER	576	IO576	IO666	666	GND
606	GND	577	IO577	IO667	667	GND
606	50_LB_ANT1	578	IO578	IO668	668	GND
606	GND	579	IO579	IO669	669	GND
606	GND	580	IO580	IO670	670	GND
606	GND	581	IO581	IO671	671	GND
606	I2C2_AOP_SDA	582	IO582	IO672	672	GND
606	I2S0_AOP_TO_SPKRAMP_TOP_BOT_LRCLK	583	IO583	IO673	673	GND
606	I2S0_AOP_FROM_SPKRAMP_TOP_BOT_DIN	584	IO584	IO674	674	GND
606	I2S0_AOP_TO_SPKRAMP_TOP_BOT_BCLK	585	IO585	IO675	675	GND
606	I2S3_AOP_TO_ARCAMP_CODEC_ASP3_BCLK	586	IO586	IO676	676	GND
606	I2S3_AOP_FROM_ARCAMP_CODEC_ASP3_DIN	587	IO587	IO677	677	GND
606	I2C2_AOP_SCL	588	IO588	IO678	678	PP1V24_S4_UPPER
606	I2S3_AOP_TO_ARCAMP_CODEC_ASP3_LRCLK	589	IO589	IO679	679	GND
606	GND	590	IO590	IO680	680	90_LPDP_ISP_FROM_WIDE_RX_D0_CONN_P
606	GND	591	IO591	IO681	681	GND
606	GND	592	IO592	IO682	682	GPIO_BB_TO_NUB_GSM_TXBURST_IND
606	50_HB_2G	593	IO593	IO683	683	GND
606	I2S3_AOP_TO_ARCAMP_CODEC_ASP3_DOUT	594	IO594	IO684	684	90_LPDP_ISP_FROM_WIDE_RX_D0_CONN_N
606	GND	595	IO595	IO685	685	GND
606	GND	596	IO596	IO686	686	GPIO_CAM_PMU1_TO_WIDE_SHDN_L_1V8
606	GND	597	IO597	IO687	687	GND
606	GND	598	IO598	IO688	688	90_LPDP_ISP_FROM_WIDE_RX_D1_CONN_P
606	PP_VDD_MAIN_5GFEML_ARC_BOT_SPK	599	IO599	IO689	689	GND
606	PP_VDD_MAIN_5GFEML_ARC_BOT_SPK	600	IO600	IO690	690	I2C1_CAM_PMU1_SCL_1V8
606	PP_VDD_MAIN_5GFEML_ARC_BOT_SPK	601	IO601	IO691	691	GND
606	PP_VDD_MAIN_5GFEML_ARC_BOT_SPK	602	IO602	IO692	692	90_LPDP_ISP_FROM_WIDE_RX_D1_CONN_N
606	GND	603	IO603	IO693	693	GND
606	GND	604	IO604	IO694	694	I2C1_CAM_PMU1_SDA_1V8
606	I2S0_AOP_TO_SPKRAMP_TOP_BOT_DOUT	605	IO605	IO695	695	GND
606	GND	606	IO606	IO696	696	90_LPDP_ISP_FROM_WIDE_RX_D2_CONN_P
606	GND	607	IO607	IO697	697	GND
606	GND	608	IO608	IO698	698	PP1V13_WIDE_DVDD
606	GND	609	IO609	IO699	699	GND
606	GND	610	IO610	IO700	700	90_LPDP_ISP_FROM_WIDE_RX_D2_CONN_N
606	50_LBDSM_TXIN	611	IO611	IO701	701	GND
606	GND	612	IO612	IO702	702	GND
606	GND	613	IO613	IO703	703	GND
606	50_LBDSM_RXIN	614	IO614	IO704	704	GND
606	GND	615	IO615	IO705	705	GND
606	GND	616	IO616	IO706	706	PPVAR_RCAM_PVDD
606	VDD_RFFE_VIO	617	IO617	IO707	707	GND
606	VDD1P12_VFE_LO	618	IO618	IO708	708	GND
606	XCVR0_RFFE0_LRX_SCLK	619	IO619	IO709	709	GND
606	XCVR0_RFFE0_LRX_SDAT	620	IO620	IO710	710	GND
606	GND	621	IO621	IO711	711	CLK_CAM_PMU1_TO_WIDE_24M_1V8
606	GND	622	IO622	IO712	712	GND
606	GND	623	IO623	IO713	713	GND
606	50_XCVR0_TX1_LB	624	IO624	IO714	714	PP1V8_RCAM_VDDIO
606	GND	625	IO625	IO715	715	GND
606	50_XCVR0_TX0_2G	626	IO626	IO716	716	90_MIPI_ISP_FROM_IRCAM_D0_P
606	GND	627	IO627	IO717	717	GND
606	50_XCVR0_TX2_LB	628	IO628	IO718	718	PPVAR_WIDE_AVDD2
606	GND	629	IO629	IO719	719	GND
606	GND	630	IO630	IO720	720	90_MIPI_ISP_FROM_IRCAM_D0_N

OMIT

Apple Proprietary and Confidential

PAGE TITLE

Interposer: BG (2/3) (601)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

998-33266

J_INT_BG

INTERPOSER-TOP-BG-V59

SMT-PAD

SYM 5 OF 6

607	GND	721	IO721	IO811	811	GND	607
607	PP3V13_WIDE_AVDD1	722	IO722	IO812	812	GND	607
607	GND	723	IO723	IO813	813	GND	607
607	90_MIPI_ISP_FROM_IRCAM_CLK_P	724	IO724	IO814	814	GND	607
607	GND	725	IO725	IO815	815	GND	607
607	GPIO_ISP_CAMS_TO_STROBE_TRIGGER_1V8	726	IO726	IO816	816	GPIO_AP_INTERPOSER_CANARY5_A_TO_B	607
607	GND	727	IO727	IO817	817	GND	607
607	90_MIPI_ISP_FROM_IRCAM_CLK_N	728	IO728	IO818	818	GND	607
607	GND	729	IO729	IO819	819	GND	607
607	GND	730	IO730	IO820	820	GPIO_AP_INTERPOSER_CANARY5_C_TO_D	607
607	GND	731	IO731	IO821	821	GND	607
607	90_MIPI_ISP_FROM_IRCAM_D1_P	732	IO732	IO822	822	GND	607
607	GND	733	IO733	IO823	823	GND	607
607	PP1V2_IRCAM_DVDD	734	IO734	IO824	824	GND	607
607	GND	735	IO735	IO825	825	GND	607
607	90_MIPI_ISP_FROM_IRCAM_D1_N	736	IO736	IO826	826	GND	607
607	GND	737	IO737	IO827	827	GND	607
607	GND	738	IO738	IO828	828	GND	607
607	GND	739	IO739	IO829	829	GPIO_AP_INTERPOSER_CANARY5_C_TO_D	607
607	GND	740	IO740	IO830	830	GND	607
607	GND	741	IO741	IO831	831	GND	607
607	CLK_CAM_PMU1_TO_IRCAM_REGULUS_12M_1V8	742	IO742	IO832	832	GND	607
607	GND	743	IO743	IO833	833	GND	607
607	PP2V79_IRCAM_AVDD_GUAD_VDD	744	IO744	IO834	834	GND	607
607	GND	745	IO745	IO835	835	GND	607
607	GND	746	IO746	IO836	836	GND	607
607	GND	747	IO747	IO837	837	GND	607
607	GND	748	IO748	IO838	838	GND	607
607	GND	749	IO749	IO839	839	GND	607
607	PP_VDD_MAIN_DPA	750	IO750	IO840	840	GND	607
607	GND	751	IO751	IO841	841	GND	607
607	IO_REGULUS_BI_GUAD_STATUS_1V8	752	IO752	IO842	842	GND	607
607	GND	753	IO753	IO843	843	GND	607
607	GND	754	IO754	IO844	844	GND	607
607	GND	755	IO755	IO845	845	GND	607
607	IO_IRCAM_TO_REGULUS_STROBE_1V8	756	IO756	IO846	846	GND	607
607	GND	757	IO757	IO847	847	GND	607
607	PP_BANFF_A_ANODE	758	IO758	IO848	848	GND	607
607	GND	759	IO759	IO849	849	GND	607
607	PP1V825_IRCAM_PMU1_IO_SW	760	IO760	IO850	850	GND	607
607	GND	761	IO761	IO851	851	GND	607
607	PP_BANFF_FLOOD_ANODE	762	IO762	IO852	852	GND	607
607	GND	763	IO763	IO853	853	GND	607
607	I2C4_CAM_PMU1_SDA_1V8	764	IO764	IO854	854	GND	607
607	GND	765	IO765	IO855	855	GND	607
607	PP_BANFF_B_ANODE	766	IO766	IO856	856	GND	607
607	GND	767	IO767	IO857	857	GND	607
607	I2C4_CAM_PMU1_SCL_1V8	768	IO768	IO858	858	GND	607
607	GND	769	IO769	IO859	859	GND	607
607	PP_BANFF_DOT_ANODE	770	IO770	IO860	860	GND	607
607	GND	771	IO771	IO861	861	GND	607
607	GPIO_NUB_FROM_BANFF_B2B_DETECT_L	772	IO772	IO862	862	GND	607
607	GND	773	IO773	IO863	863	GND	607
607	GPIO_CAM_PMU1_TO_IRCAM_SHDN_L_1V8	774	IO774	IO864	864	GND	607
607	CLK_BBPMU_TO_NFC_P_38M4	775	IO775	IO865	865	GND	607
607	GND	776	IO776	IO866	866	GND	607
607	GND	777	IO777	IO867	867	GND	607
607	GND	778	IO778	IO868	868	GND	607
607	GND	779	IO779	IO869	869	GND	607
607	IO_SLM_BUTTON_SIDE_L_1V8_CONN	780	IO780	IO870	870	GND	607
607	GND	781	IO781	IO871	871	GND	607
607	PP_VDD_MAIN_2GFEMU	782	IO782	IO872	872	GND	607
607	GND	783	IO783	IO873	873	GND	607
607	IO_SLM_BUTTON_SIDE_L_1V8	784	IO784	IO874	874	GND	607
607	GND	785	IO785	IO875	875	GND	607
607	GND	786	IO786	IO876	876	GND	607
607	GND	787	IO787	IO877	877	GND	607
607	NFC_P_ANT_NEG	788	IO788	IO878	878	GND	607
607	GND	789	IO789	IO879	879	GND	607
607	GND	790	IO790	IO880	880	GND	607
607	NFC_P_ANT_NEG	791	IO791	IO881	881	GND	607
607	NFC_P_ANT_NEG	792	IO792	IO882	882	GND	607
607	GND	793	IO793	IO883	883	GND	607
607	GND	794	IO794	IO884	884	GND	607
607	GND	795	IO795	IO885	885	GND	607
607	GND	796	IO796	IO886	886	GND	607
607	GND	797	IO797	IO887	887	GND	607
607	PP2V94_FCAM_AVDD	798	IO798	IO888	888	GND	607
607	GND	799	IO799	IO889	889	GND	607
607	GND	800	IO800	IO890	890	GND	607
607	GPIO_CAM_PMU1_TO_FCAM_SHDN_L_1V8	801	IO801	IO891	891	GND	607
607	PP1V825_FCAM_PMU1_IO_SW	802	IO802	IO892	892	GND	607
607	I2C3_CAM_PMU1_SDA_1V8	803	IO803	IO893	893	GND	607
607	GND	804	IO804	IO894	894	GND	607
607	I2C3_CAM_PMU1_SCL_1V8	805	IO805	IO895	895	GND	607
607	GND	806	IO806	IO896	896	GND	607
607	GND	807	IO807	IO897	897	GND	607
607	GPIO_AP_INTERPOSER_CANARY5_A_TO_B	808	IO808	IO898	898	GND	607
607	GND	809	IO809	IO899	899	GND	607
607	GND	810	IO810	IO900	900	GND	607

6MIT

998-33266

J_INT_BG

INTERPOSER-TOP-BG-V59

SMT-PAD

SYM 6 OF 6

607	GND	901	IO901
607	GND	902	IO902
607	GND	903	IO903
607	GND	904	IO904
607	GND	905	IO905
607	GND	906	IO906
607	GND	907	IO907
607	GND	908	IO908
607	GND	909	IO909
607	GND	910	IO910
607	GND	911	IO911
607	GND	912	IO912
607	GND	913	IO913
607	GND	914	IO914
607	GND	915	IO915
607	GND	916	IO916
607	GND	917	IO917
607	GND	918	IO918
607	GND	919	IO919
607	GND	920	IO920
607	GND	921	IO921
607	GND	922	IO922
607	GND	923	IO923
607	GND	924	IO924
607	GND	925	IO925
607	GND	926	IO926
607	GND	927	IO927
607	GND	928	IO928

12MIT

Apple Proprietary and Confidential

PAGE TITLE

Interposer: BG (3/3) (602)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

8	7	6	5	4	3	2	1

D			D
C			C
B			B
A			A

8	7	6	5	4	3	2	1

GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
PP1V17_FCAM_DVDD	PP1V17_FCAM_DVDD	109
CLK_CAM_PMU1_TO_FCAM_12M_1V8	CLK_CAM_PMU1_TO_FCAM_12M_1V8	109
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_P	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_P	109
90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_N	90_LPDP_ISP_FROM_FCAM_RX_D0_CONN_N	109
GND	GND	603 604 605 606 607
90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_N	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_N	109
90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_P	90_LPDP_ISP_FROM_FCAM_RX_D1_CONN_P	109
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
COIL_TO_SPKRAMP_TOP_VSENSE_POS_CONN	COIL_TO_SPKRAMP_TOP_VSENSE_POS_CONN	120
COIL_TO_SPKRAMP_TOP_VSENSE_NEG_CONN	COIL_TO_SPKRAMP_TOP_VSENSE_NEG_CONN	120
GND	GND	603 604 605 606 607
SPKRAMP_TOP_TO_COIL_OUT_NEG	SPKRAMP_TOP_TO_COIL_OUT_NEG	120
SPKRAMP_TOP_TO_COIL_OUT_POS	SPKRAMP_TOP_TO_COIL_OUT_POS	120
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
NFC_P_ANT_POS	NFC_P_ANT_POS	120 342 603
NFC_P_ANT_POS	NFC_P_ANT_POS	120 342 603
GND	GND	603 604 605 606 607
NFC_P_ANT_POS	NFC_P_ANT_POS	120 342 603
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607

8	7	6	5	4	3	2	1

D		D
C		C
B		B
A		A

GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
SWD_NUB_BI_BB_SWDIO	SWD_NUB_BI_BB_SWDIO	600 342
GND	GND	600 603 604 605 606 607
SWD_NUB_TO_BB_SWCLK	SWD_NUB_TO_BB_SWCLK	600 342
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
90_PCIE_GP1_AP_TO_BB_REFCLK_N	90_PCIE_GP1_AP_TO_BB_REFCLK_N	600 141
GND	GND	600 603 604 605 606 607
90_PCIE_GP1_AP_TO_BB_REFCLK_P	90_PCIE_GP1_AP_TO_BB_REFCLK_P	600 141
GND	GND	600 603 604 605 606 607
90_PCIE_GP1_AP_TO_BB_TX_P	90_PCIE_GP1_AP_TO_BB_TX_P	600 141
GND	GND	600 603 604 605 606 607
90_PCIE_GP1_AP_TO_BB_TX_N	90_PCIE_GP1_AP_TO_BB_TX_N	600 141
GND	GND	600 603 604 605 606 607
90_PCIE_GP1_AP_FROM_BB_RX_N	90_PCIE_GP1_AP_FROM_BB_RX_N	600 141
GND	GND	600 603 604 605 606 607
90_PCIE_GP1_AP_FROM_BB_RX_P	90_PCIE_GP1_AP_FROM_BB_RX_P	600 141
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
90_EUSB_BB_DBG_N	90_EUSB_BB_DBG_N	600 342
GND	GND	600 603 604 605 606 607
90_EUSB_BB_DBG_P	90_EUSB_BB_DBG_P	600 342
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
GND	GND	600 603 604 605 606 607
PP_VDD_MAIN_BBPMU	PP_VDD_MAIN_BBPMU	600 342 604

601	PP_CODEC_TO_MIC1_LOWER_BIAS	PP_CODEC_TO_MIC1_LOWER_BIAS	113
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	90_E85_USB_BOT_CONN_P	90_E85_USB_BOT_CONN_P	113
601	GND	GND	603 604 605 606 607
601	90_E85_USB_BOT_CONN_N	90_E85_USB_BOT_CONN_N	113
601	GND	GND	603 604 605 606 607
601	90_E85_USB_TOP_CONN_N	90_E85_USB_TOP_CONN_N	113
601	GND	GND	603 604 605 606 607
601	90_E85_USB_TOP_CONN_P	90_E85_USB_TOP_CONN_P	113
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	PP_E85_CC1_CONN	PP_E85_CC1_CONN	113
601	GND	GND	603 604 605 606 607
601	PP_E85_CC2_CONN	PP_E85_CC2_CONN	113
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	IO_E85_TO_ACE_CON_DETECT_L_CONN	IO_E85_TO_ACE_CON_DETECT_L_CONN	113
601	GND	GND	603 604 605 606 607
601	GPIO_AOP_FROM_BARO_INT_L	GPIO_AOP_FROM_BARO_INT_L	113
601	GND	GND	603 604 605 606 607
601	I2C1_AOP_SCL	I2C1_AOP_SCL	141
601	GND	GND	603 604 605 606 607
601	I2C1_AOP_SDA	I2C1_AOP_SDA	141
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	GND	GND	603 604 605 606 607
601	PP_VBUS1_E85	PP_VBUS1_E85	113 605
601	PP_VBUS1_E85	PP_VBUS1_E85	113 605

8	7	6	5	4	3	2	1

D			D
C			C
B			B
A			A

8	7	6	5	4	3	2	1

GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607
GND	GND	603 604 605 606 607

8	7	6	5	4	3	2	1

D

C

B

A

| | | |

		CK APPD
		DATE
		2024-09-17

SHEET	PAGE/CSA	CONTENTS		
1	1	TOC		
2	2	NFC_IO		
3	75	NFC_P_FE		

Apple Proprietary and Confidential

DRAWING TITLE

SCH,MLB,BG

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

REV	ECN	DESCRIPTION OF REVISION	CK APPD / DATE
6	0058492950	ENGINEERING RELEASED	2024-09-17

HIER_NFC_BG

IO PORTS

PRIMARY NFC RF

682 NFC_P_ANT_POS

682 NFC_P_ANT_NEG

Apple Proprietary and Confidential

DRAWING TITLE

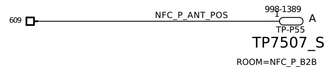
SCH,MLB,BG

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

PRIMARY NFC FRONT END



TP7507_S

ROOM=NFC_P_B2B

TP7508_S

ROOM=NFC_P_B2B

Apple Proprietary and Confidential

PAGE TITLE

NFC_P_FE (75)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

				CK APPD / DATE
				2024-09-17

SHEET	PAGE/CSA	CONTENTS		
1	1	TABLE OF CONTENTS		
2	2	WLAN SYMBOL IO PORTS		
3	3	BOM Table		
4	4	Probe Points		
5	5	THELONIOUS		
6	6	5G rFEM (UAT)		
7	7	5G rFEM (LAT)		
8	8	2G4 rFEM (UAT)		
9	9	2G4 rFEM (LAT)		

Apple Proprietary and Confidential

DRAWING TITLE

SCH,MLB,BG

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

WLAN SYMBOL IO PORTS

FEM POWER

688 K2 PP_VDD_MAIN_5GFEMU VOLTAGE=3.8 V
689 K2 PP_VDD_MAIN_5GFEML_ARC_BOT_SPK VOLTAGE=3.8 V
690 K2 PP_VDD_MAIN_2GFEMU VOLTAGE=3.8 V

5GHz rFEM (UAT)

688 K2 50_WLAN_A_ANT6

5GHz rFEM (LAT)

689 K2 50_WLAN_A_ANT5

2.4GHz rFEM (UAT)

690 K2 50_WLAN_G_BT_ANT4_NPLXR

2.4GHZ RFEM (LAT)

687 K2 50_WLAN_G_C1_TXRX_FEM_M
686 687 K2 RFFE_WLAN_TO_LAT_2G_FEM_RST_L
691 K2 50_WLAN_G_BT_LAT
691 K2 50_WLAN_G_BT_ANT3_NPLXR
686 687 K2 GPIO_WLAN_TO_LAT_2G_FEM_LNA_BYP_EN
686 687 K2 ANALOG_LAT_2G_FEM_TO_WLAN_PDTS

RFFE LAT

687 689 K2 SHIELD_RFFE_WLAN_TO_LAT_FEMS_CLK
687 689 K2 SHIELD_RFFE_WLAN_TO_LAT_FEMS_DATA

POWER

686 687 K2 PP_VDD_MAIN_WLAN VOLTAGE=3.8 V
687 K2 PP1V825_S4_UPPER VOLTAGE=1.825 V
688 690 K2 PP1V825_S4_UPPER VOLTAGE=1.825 V
687 K2 PP1V24_S4_UPPER VOLTAGE=1.24 V
689 K2 PP1V825_S2_LOWER VOLTAGE=1.825 V

AP CONNECTIONS

687 K2 GPIO_AP_FROM_WLAN_TIME_SYNC
686 687 K2 GPIO_AP_FROM_BT_AUDIO_SYNC

PCIE

686 687 K2 PCIE_GP0_AP_TO_WLAN_PERST_L
686 687 K2 PCIE_GP0_AP_BI_WLAN_CLKREQ_L
686 687 K2 90_PCIE_GP0_AP_TO_WLAN_TX_P
686 687 K2 90_PCIE_GP0_AP_TO_WLAN_TX_N
686 687 K2 90_PCIE_GP0_AP_FROM_WLAN_RX_P
686 687 K2 90_PCIE_GP0_AP_FROM_WLAN_RX_N
686 687 K2 90_PCIE_GP0_AP_TO_WLAN_REFCLK_P
686 687 K2 90_PCIE_GP0_AP_TO_WLAN_REFCLK_N

AOP CONNECTIONS

686 687 K2 SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK
686 687 K2 SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA_R
686 687 K2 SPMI1_COEX_AOP_TO_BB_WLAN_CLK
686 687 K2 SPMI1_COEX_AOP_BI_BB_WLAN_DATA_R

PMU CONNECTIONS

686 687 K2 GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON
686 687 K2 GPIO_PMU_FROM_WLAN_HOST_WAKE
686 687 K2 CLK_GPIO_S4_PMU_TO_WLAN_32K

SE CONNECTIONS

686 687 K2 I2C_S4_BT_TO_SE_SCL
686 687 K2 I2C_S4_BT_TO_SE_SDA
687 K2 GPIO_S4_SE_TO_BT_PKT_RDY

SPKR CONNECTIONS

687 K2 GPIO_S4_BT_TO_BOT_SPKR_TRIG

Apple Proprietary and Confidential

PAGE TITLE
WLAN SYMBOL IO PORTS (2)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

BOM TABLE

WLAN ALT

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
339S01445	339S01444	U_WLAN_W	STATS ALT PN

BUCK ALT

ALTERNATE PART NO.	PRIMARY PART NO.	REFERENCE DESIGNATORS	COMMENT
138S00024	138S0986	C254_W	TAIYO ALT PART
138S00024	138S0986	C256_W	TAIYO ALT PART
152S01962	152S00750	L253_W,L255_W	TAIYO ALT PART

Apple Proprietary and Confidential

PAGE TITLE

BOM Table (3)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

PROBE POINTS

PP250_W_P2MM-NSM PP 1 CLK_GPIO_S4_PMU_TO_WLAN_32K ROOM=WLAN 684 687
PP251_W_P2MM-NSM PP 1 GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON ROOM=WLAN 684 687
PP252_W_P2MM-NSM PP 1 GPIO_PMU_FROM_WLAN_HOST_WAKE ROOM=WLAN 684 687
PP253_W_P2MM-NSM PP 1 PCIE_GP0_AP_TO_WLAN_PERST_L ROOM=WLAN 684 687
PP254_W_P2MM-NSM PP 1 PCIE_GP0_AP_BI_WLAN_CLKREQ_L ROOM=WLAN 684 687
PP255_W_P2MM-NSM PP 1 90_PCIE_GP0_AP_TO_WLAN_REFCLK_P ROOM=WLAN 684 687
PP256_W_P2MM-NSM PP 1 90_PCIE_GP0_AP_TO_WLAN_REFCLK_N ROOM=WLAN 684 687
PP257_W_P2MM-NSM PP 1 90_PCIE_GP0_AP_FROM_WLAN_RX_P ROOM=WLAN 684 687
PP258_W_P2MM-NSM PP 1 90_PCIE_GP0_AP_FROM_WLAN_RX_N ROOM=WLAN 684 687
PP259_W_P2MM-NSM PP 1 90_PCIE_GP0_AP_TO_WLAN_TX_P ROOM=WLAN 684 687
PP260_W_P2MM-NSM PP 1 90_PCIE_GP0_AP_TO_WLAN_TX_N ROOM=WLAN 684 687
PP261_W_P2MM-NSM PP 1 SPMI1_COEX_AOP_TO_BB_WLAN_CLK ROOM=WLAN 684 687
PP262_W_P2MM-NSM PP 1 SPMI1_COEX_AOP_BI_BB_WLAN_DATA_R ROOM=WLAN 684 687
PP263_W_P2MM-NSM PP 1 SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK ROOM=WLAN 684 687
PP264_W_P2MM-NSM PP 1 SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA_R ROOM=WLAN 684 687
PP271_W_P2MM-NSM PP 1 GPIO_AP_FROM_BT_AUDIO_SYNC ROOM=WLAN 684 687
PP274_W_P2MM-NSM PP 1 I2C_S4_BT_TO_SE_SCL ROOM=WLAN 684 687
PP275_W_P2MM-NSM PP 1 I2C_S4_BT_TO_SE_SDA ROOM=WLAN 684 687
PP400_W_P2MM-NSM PP 1 RFFE_WLAN_TO_LAT_2G_FEM_RST_L ROOM=WLAN 684 687
PP401_W_P2MM-NSM PP 1 ANALOG_LAT_2G_FEM_TO_WLAN_PDTS ROOM=WLAN 684 687
PP402_W_P2MM-NSM PP 1 GPIO_WLAN_TO_LAT_2G_FEM_LNA_BYP_EN ROOM=WLAN 684 687
PP276_W_P2MM-NSM PP 1 JTAG_WLAN_SEL ROOM=WLAN 687
PP277_W_P2MM-NSM PP 1 JTAG_WLAN_TCK ROOM=WLAN 687
PP278_W_P2MM-NSM PP 1 JTAG_WLAN_TMS ROOM=WLAN 687
PP279_W_P2MM-NSM PP 1 JTAG_WLAN_TRST_L ROOM=WLAN 687
PP284_W_P2MM-NSM PP 1 PP_VDD_MAIN_WLAN ROOM=WLAN 684 687

Apple Proprietary and Confidential

PAGE TITLE

Probe Points (4)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

WIFI/BT

5G INTERSTATE BPFS

L201_W 0.2NH-+/-0.05NH-1.0A
L203_W 2.4NH-+/-3%-0.34OHM
FL_ISG_U_W ACPF-7350-AP2
L233_W 0.5NH-+/-0.05NH-0.1A
L202_W 1.1NH-+/-3%-0.35A-0.33OOHM
FL_ISG_L_W ACPF-7350-AP2
L235_W 1.1NH-+/-0.1NH-0.85A
L237_W 0.5NH-+/-0.05NH-0.1A
L238_W 1.4NH-+/-0.1NH-0.70A

50_WLAN_A_C0_TXRX_FEM_M
50_WLAN_A_C0_TXRX_BPF
50_WLAN_A_C0_TXRX_BPF_R
50_WLAN_A_C0_TXRX
50_WLAN_A_C1_TXRX_FEM_M
50_WLAN_A_C1_TXRX_BPF
50_WLAN_A_C1_TXRX_BPF_R
50_WLAN_G_C0_TXRX_FEM_M
50_WLAN_G_C0_TXRX_R
50_WLAN_G_C1_TXRX_FEM_M
50_WLAN_G_C1_TXRX_R

C204_W 0.3PF +/-0.05PF 16V C0G-CERM 01005 NOSTUFF ROOM=WLAN
C205_W 0.3PF +/-0.05PF 16V C0G-CERM 01005 NOSTUFF ROOM=WLAN GND_VOID=TRUE
C206_W 0.3PF +/-0.05PF 16V C0G-CERM 01005 NOSTUFF ROOM=WLAN
C201_W 0.3PF +/-0.05PF 16V C0G-CERM 01005 NOSTUFF ROOM=WLAN
R202_W 0 0% 1/32W TK 01005 ROOM=WLAN
C228_W 0.2PF +/-0.05PF 16V CERM 01005
C241_W 0.2PF +/-0.05PF 16V CERM 01005
C230_W 0.2PF +/-0.05PF 16V CERM 01005
C243_W 0.2PF +/-0.05PF 16V CERM 01005
C231_W 0.2PF +/-0.05PF 16V CERM 01005
C244_W 0.2PF +/-0.05PF 16V CERM 01005

PP1V24_S4_UPPER — VOLTAGE=1.24 V

C250_W 27PF 5% 16V NP0-C0G 01005-1 ROOM=WLAN

PP1V825_S4_UPPER — VOLTAGE=1.825 V

C252_W 27PF 5% 16V NP0-C0G 01005-1 ROOM=WLAN
C257_W 27PF 5% 16V NP0-C0G 01005-1 ROOM=WLAN

PP_VDD_MAIN_WLAN — VOLTAGE=3.8 V

C232_W 10UF 20% 10V X5R-CERM 0402-8 ROOM=WLAN
C233_W 4.7PF +/-0.1PF 16V NP0/C0G 01005 ROOM=WLAN

PP_VDD_MAIN_WLAN

C245_W 10UF 20% 10V X5R-CERM 0402-8 ROOM=WLAN
C247_W 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=WLAN
C246_W 27PF 5% 16V NP0-C0G 01005-1 ROOM=WLAN

L253_W 2.2UH-20%-1.1A-0.293OHM

PART_NUMBER=152S00750
DIDT=TRUE 0603 ROOM=WLAN
PP1V02_ABUCK_L VOLTAGE=1.02 V
C254_W 7.5UF 20% 4V CERM 0402 ROOM=WLAN
C258_W 0.2PF 0.05PF 16V C0G 01005
PP1V02_ABUCK VOLTAGE=1.02 V

L255_W 2.2UH-20%-1.1A-0.293OHM

PART_NUMBER=152S00750
LX_CSR DIDT=TRUE 0603 ROOM=WLAN
PP0V72_CBUCK_L VOLTAGE=0.72 V
C256_W 7.5UF 20% 4V CERM 0402 ROOM=WLAN
PP0V72_CBUCK VOLTAGE=0.72 V

LX_ASR
NC

U_WLAN_W 2103-190107-10 LGA SYM 1 OF 2

339S01444

28	5G_C0_ANT	
56	5GTSSI_C0	ANALOG_UAT_5G_FEM_TO_WLAN_PDTS
12	5G_C1_ANT	50_WLAN_A_C1_TXRX
10	5GTSSI_C1	ANALOG_LAT_5G_FEM_TO_WLAN_PDTS
196	2G_C0_ANT	50_WLAN_G_C0_TXRX_R
168	2GTSSI_C0	ANALOG_UAT_2G_FEM_TO_WLAN_PDTS
112	2G_C1_ANT	
140	2GTSSI_C1	ANALOG_LAT_2G_FEM_TO_WLAN_PDTS
61	LNA_EN_5GC0	GPIO_WLAN_TO_UAT_5G_FEM_LNA_BYP_EN
46	LNA_EN_5GC1	GPIO_WLAN_TO_LAT_5G_FEM_LNA_BYP_EN
62	LNA_EN_2GC0	GPIO_WLAN_TO_UAT_2G_FEM_LNA_BYP_EN
20	LNA_EN_2GC1	GPIO_WLAN_TO_LAT_2G_FEM_LNA_BYP_EN
48	5G_C0_RESET	RFFE_WLAN_TO_UAT_5G_FEM_RST_L
33	2G_C0_RESET	RFFE_WLAN_TO_UAT_2G_FEM_RST_L
50	C0_MIPI_CLK	SHIELD_RFFE_WLAN_TO_UAT_FEMS_CLK
49	C0_MIPI_DATA	SHIELD_RFFE_WLAN_TO_UAT_FEMS_DATA
19	5G_C1_RESET	RFFE_WLAN_TO_LAT_5G_FEM_RST_L
34	2G_C1_RESET	RFFE_WLAN_TO_LAT_2G_FEM_RST_L
36	C1_MIPI_CLK	SHIELD_RFFE_WLAN_TO_LAT_FEMS_CLK
35	C1_MIPI_DATA	SHIELD_RFFE_WLAN_TO_LAT_FEMS_DATA
83	WL_GPIO_7/DAP_SEL	NC
120	WL_GPIO_18	NC
105	WLBT_SECI_IN	NC
119	WLBT_SECI_OUT	NC
147	WLAN_TIME_SYNC	GPIO_AP_FROM_WLAN_TIME_SYNC
130	LHL_GPIO2	NC
157	SPMI_IDC_CLK	SPMI1_COEX_AOP_TO_BB_WLAN_CLK
144	SPMI_IDC_DAT	SPMI1_COEX_AOP_BI_BB_WLAN_DATA_R
44	WLBT_WL_PCIE_PERST_L	PCIE_GP0_AP_TO_WLAN_PERST_L
86	WLBT_WL_PCIE_CLKREQ_L	PCIE_GP0_AP_BI_WLAN_CLKREQ_L
29	90_WLBT_WL_PCIE_RD_P	90_PCIE_GP0_AP_TO_WLAN_TX_P
15	90_WLBT_WL_PCIE_RD_N	90_PCIE_GP0_AP_TO_WLAN_TX_N
71	90_WLBT_WL_PCIE_TD_P	90_PCIE_GP0_AP_FROM_WLAN_RX_P
57	90_WLBT_WL_PCIE_TD_N	90_PCIE_GP0_AP_FROM_WLAN_RX_N
113	90_WLBT_WL_PCIE_REFCLK_P	90_PCIE_GP0_AP_TO_WLAN_REFCLK_P
99	90_WLBT_WL_PCIE_REFCLK_N	90_PCIE_GP0_AP_TO_WLAN_REFCLK_N
47	RF_SW_CTRL_3	NC
172	CLK_REQ	NC

C226_W 27PF 5% 16V NP0-C0G 01005-1 ROOM=WLAN

104	WLBT_WL_FAST_UART_RX	NC
75	WLBT_WL_FAST_UART_RTS_OUT	NC
89	WLBT_WL_FAST_UART_CTS_IN	NC
90	WLBT_WL_FAST_UART_TX	NC
91	WLBT_WL_HOST_WAKE	GPIO_PMU_FROM_WLAN_HOST_WAKE
174	WLBT_WL_REG_ON	GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON
74	WLAN_TDI/CXT_A	NC
60	WLAN_TDO/CXT_B	NC
64	WLAN_TRST_L	JTAG_WLAN_TRST_L
171	JTAG_SEL	JTAG_WLAN_SEL
103	WLAN_SCT/SWD_CLK	JTAG_WLAN_TCK
78	WLAN_TMS/SWD_DAT	JTAG_WLAN_TMS
146	WL_GPIO_21/BT_OVER_UART	NC
177	WLBT_BT_UART_RXD	NC
178	WLBT_BT_UART_RTS_L	NC
176	WLBT_BT_UART_CTS_L	NC
175	WLBT_BT_UART_TXD	NC
189	WLBT_BT_DEV_WAKE	GPIO_S4_BT_TO_BOT_SPKR_TRIG
173	WLBT_BT_REG_ON	NC
116	1V2_WIFI_TO_SENSORA_COEX	NC
134	1V2_BT_TO_SENSORA_COEX	NC
77	1V8_WIFI_TO_SENSORA_COEX	NC
76	1V8_BT_TO_SENSORA_COEX	NC
161	GPIO_SENSORB_TO_BT_SYNC	GPIO_S4_SE_TO_BT_PKT_RDY
118	SENSORC_TO_WIFI_COEX	NC
117	WIFI_TO_SENSORC_COEX	NC
160	BT_TO_SENSORC_TIME_SYNC	NC
133	BT_TO_SENSORC_WAKE	NC
162	SOC_TO_BT_TIME_SYNC	NC
191	BT_TO_AP_TIME_SYNC	GPIO_AP_FROM_BT_AUDIO_SYNC (CKPLUS_WAIVE=I2C_PULLUP)
158	SE_I2C_CLK	I2C_S4_BT_TO_SE_SCL
159	SE_I2C_DAT	I2C_S4_BT_TO_SE_SDA (CKPLUS_WAIVE=I2C_PULLUP)
132	SPMI_HEB_CLK	SPMI0_HEB_AOP_TO_BB_WLAN_NFC_CLK
131	SPMI_HEB_DAT	SPMI0_HEB_AOP_BI_BB_WLAN_NFC_DATA_R
145	WLBT_CLK_32K	CLK_GPIO_S4_PMU_TO_WLAN_32K
8	TCXO_IN	NC

U_WLAN_W 2103-190107-10 LGA SYM 2 OF 2

1	GND	GND	98
2	GND	GND	100
4	GND	GND	101
7	GND	GND	102
9	GND	GND	106
11	GND	GND	107
13	GND	GND	108
14	GND	GND	109
16	GND	GND	110
18	GND	GND	111
21	GND	GND	114
22	GND	GND	115
23	GND	GND	121
24	GND	GND	122
25	GND	GND	123
26	GND	GND	124
27	GND	GND	125
30	GND	GND	126
31	GND	GND	127
32	GND	GND	128
37	GND	GND	129
38	GND	GND	135
39	GND	GND	136
40	GND	GND	137
41	GND	GND	138
42	GND	GND	139
43	GND	GND	142
45	GND	GND	143
51	GND	GND	148
52	GND	GND	149
53	GND	GND	150
54	GND	GND	151
55	GND	GND	152
58	GND	GND	153
59	GND	GND	154
65	GND	GND	155
66	GND	GND	156
67	GND	GND	163
68	GND	GND	164
69	GND	GND	166
70	GND	GND	167
72	GND	GND	170
73	GND	GND	192
79	GND	GND	193
80	GND	GND	180
81	GND	GND	181
82	GND	GND	182
83	GND	GND	185
84	GND	GND	187
85	GND	GND	188
87	GND	GND	190
88	GND	GND	195
92	GND	GND	197
93	GND	GND	199
94	GND	GND	201
95	GND	GND	203
96	GND	GND	208
97	GND	GND	209
		GND	210

SENSOR A = DOTARA
SENSOR B = SE
SENSOR C = R1

GPIO_SEQ_S4_PMU_TO_WLAN_REG_ON — R258_W 200K 1% 1/32W TK 01005-1 ROOM=WLAN
GPIO_PMU_FROM_WLAN_HOST_WAKE — R259_W 100K 5% 1/32W TK 01005 ROOM=WLAN
JTAG_WLAN_SEL — R257_W 10K 5% 1/32W TK 01005-1 ROOM=WLAN (STUFFED= JTAG DISABLED)

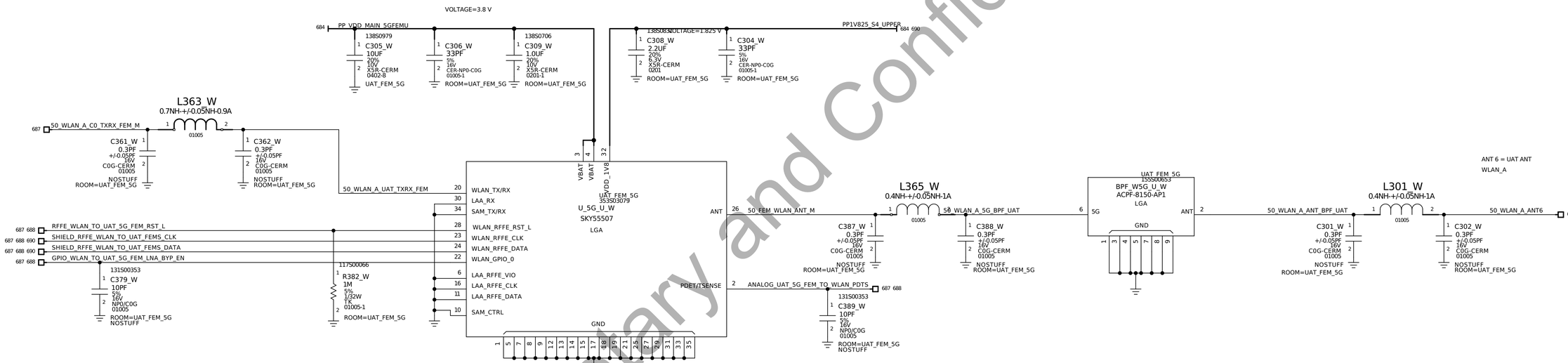
Apple Proprietary and Confidential

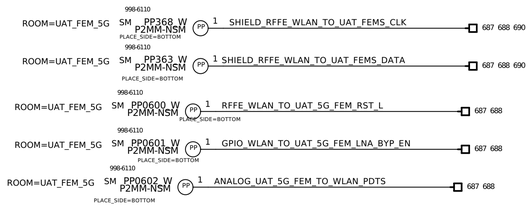
PAGE TITLE: WiFi/BT (5)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

UAT 5GHZ RFEM





Apple Proprietary and Confidential

PAGE TITLE

5G rFEM (UAT) (6)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

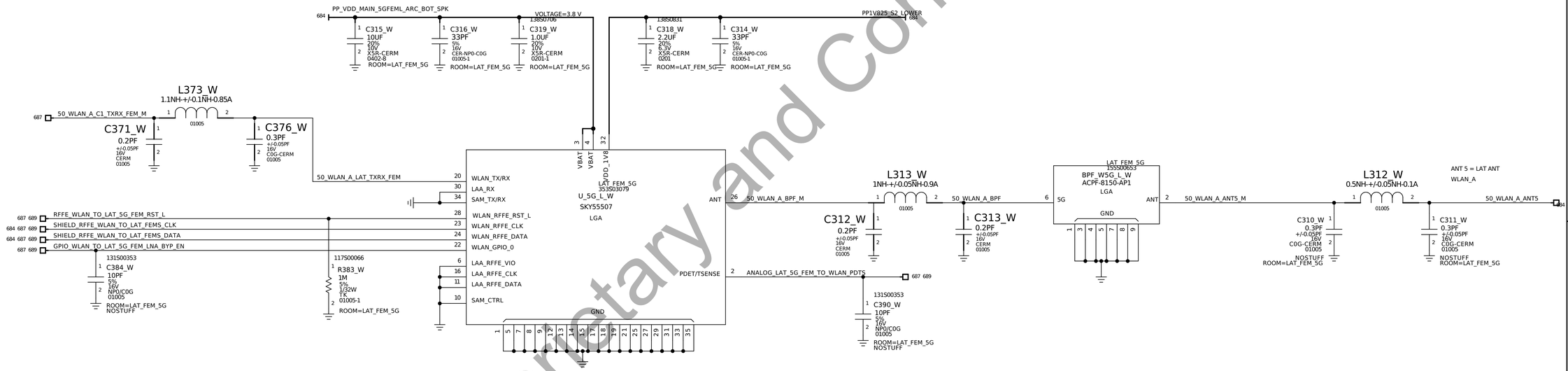
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

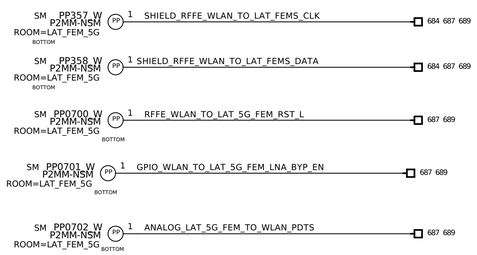
II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

LAT 5GHZ RFEM





Apple Proprietary and Confidential

PAGE TITLE

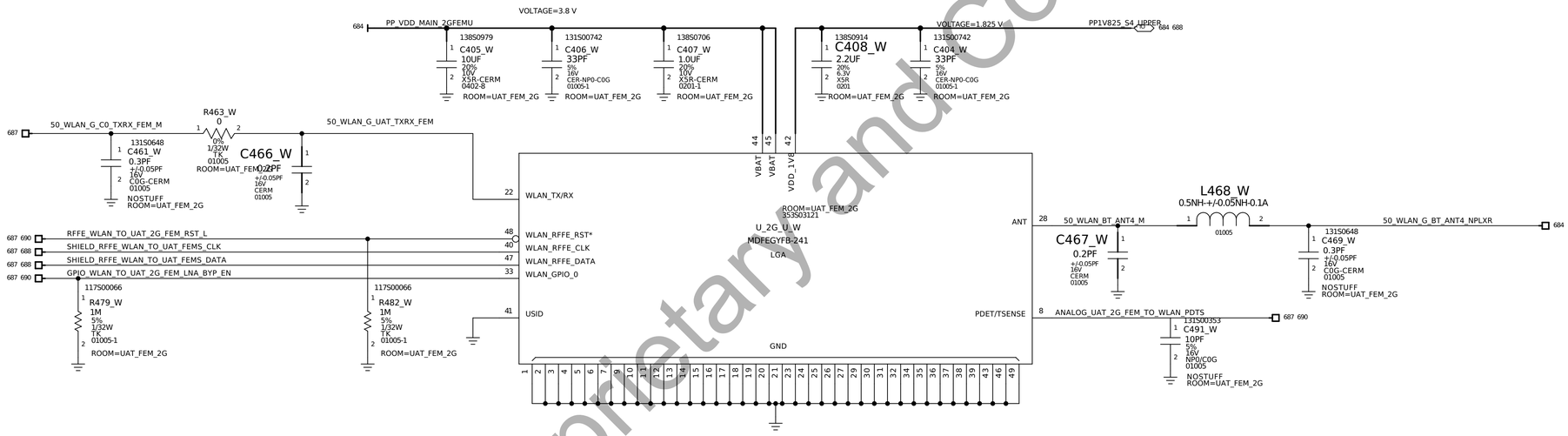
5G rFEM (LAT) (7)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

UAT 2.4 GHZ RFEM



Apple Proprietary and Confidential

PAGE TITLE

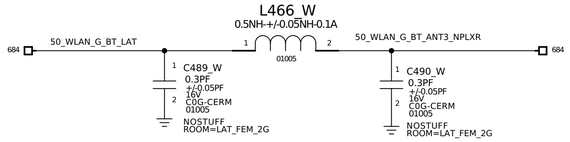
2G4 rFEM (UAT) (8)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

LAT 2.4 GHZ RFEM



Apple Proprietary and Confidential

PAGE TITLE

2G4 rFEM (LAT) (9)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

REV	ECN	DESCRIPTION OF REVISION	CK APPD / DATE
6	0058492950	ENGINEERING RELEASED	2024-09-17

HIER_RADIO_S_BG

SHEET	PAGE/CSA	CONTENTS		
1	1	TITLE PAGE		
2	2	PORTS		
3	3	BLOCK DIAGRAM		
4	4	BBPMU (1/2)		
5	5	BBPMU (2/2)		
6	6	BASEBAND (1/3)		
7	7	BASEBAND (2/3)		
8	8	BASEBAND (3/3)		
9	9	CLOCKING		
10	10	CARPO		
11	11	CARPO POWER		
12	12	ETIC		
13	13	FR1 LAT LB/2G SPAD		
14	14	FR1 LAT HB SPAD		
15	15	FR1 LAT UHB SPAD		
16	16	FR1 LAT MIMO DSM		
17	17	FR1 LAT COUPLERS		
18	18	FR1 UAT TX DSM		
19	19	FR1 UAT UHB DSM		
20	20	FR1 UAT RX (1/2)		
21	21	FR1 UAT RX (2/2)		
22	22	FR1 UAT COUPLERS		
23	23	FR1 UAT ANTENNAS & GPS		
24	24	FR1 ANTENNA TUNERS		
25	25	TEST POINTS		
26	26	CONSTRAINTS		

Apple Proprietary and Confidential

DRAWING TITLE

SCH,MLB,BG

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

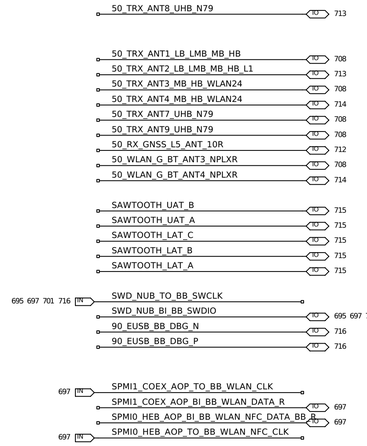
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

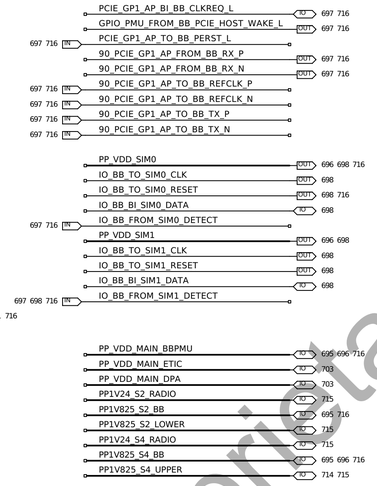
II NOT TO REPRODUCE OR COPY IT

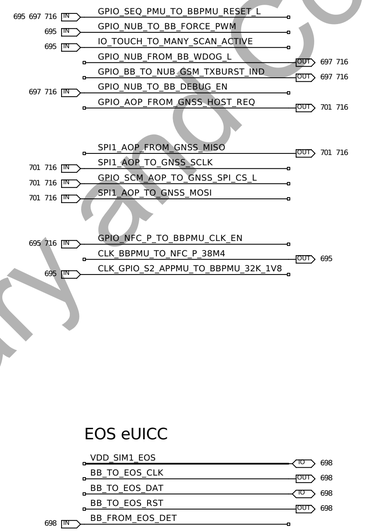
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

IV ALL RIGHTS RESERVED

PORTS



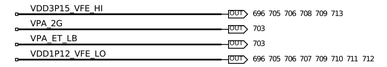




EOS eUICC

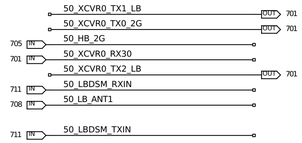
CONNECTIONS TO MLB_CG

POWER



RFFE

LB+2G SPAD



Apple Proprietary and Confidential

PAGE TITLE

PORTS (2)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

BLOCK DIAGRAM

BLANK PAGE

Apple Proprietary and Confidential

PAGE TITLE

BLOCK DIAGRAM (3)

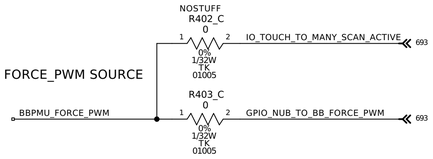
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

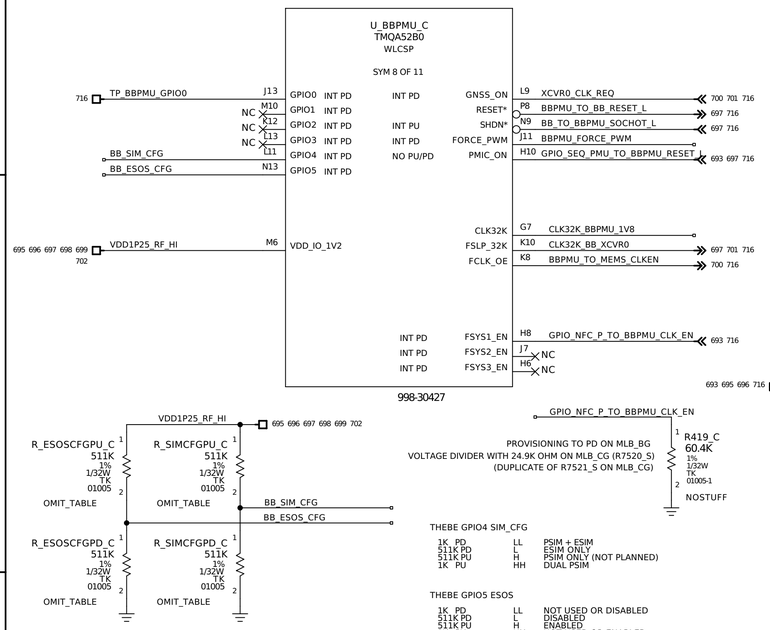
FORCE_PWM SOURCE



SIM CONFIG

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
118S00255	RFSKU:CHN	R_SIMCFGPU_C	CRITICAL	1	RES,TK,1K OHM,1%,1/32W,01005
118S00244	RFSKU:US	R_SIMCFGPD_C	CRITICAL	1	RES,TK,511K OHM,1%,1/32W,01005
118S00255	RFSKU:RS	R_SIMCFGPD_C	CRITICAL	1	RES,TK,1K OHM,1%,1/32W,01005
118S00255	RFSKU:ROW	R_SIMCFGPD_C	CRITICAL	1	RES,TK,1K OHM,1%,1/32W,01005

GPIOS



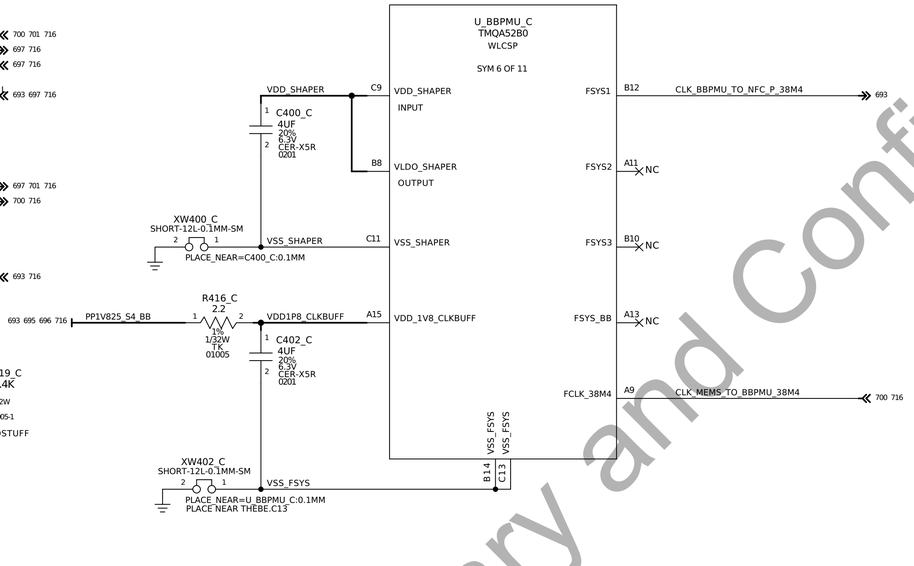
THEBE GPIO4 SIM_CFG

1K PD	LL	PSIM + ESIM
511K PD	L	ESIM ONLY
511K PU	H	PSIM ONLY (NOT PLANNED)
1K PU	HH	DUAL PSIM

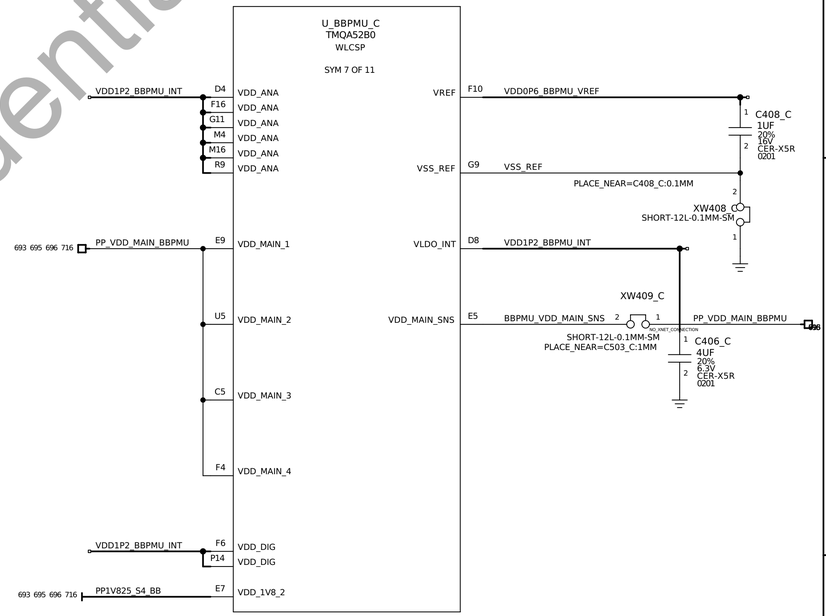
THEBE GPIO5 ESOS

1K PD	LL	NOT USED OR DISABLED
511K PD	L	DISABLED
511K PU	H	ENABLED
1K PU	HH	NOT USED OR ENABLED

CLOCKING

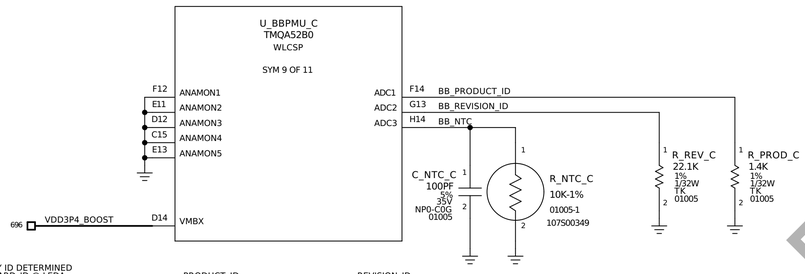


SUPPLIES



SUPPLIED BY AP'S PP1V8_S4 TO
ENABLE NFC CLOCKING IN LPEM

ADC



FAMILY ID DETERMINED
BY BOARD_ID @ LEDA

BOARD_ID=0X3=2025 IPHONE

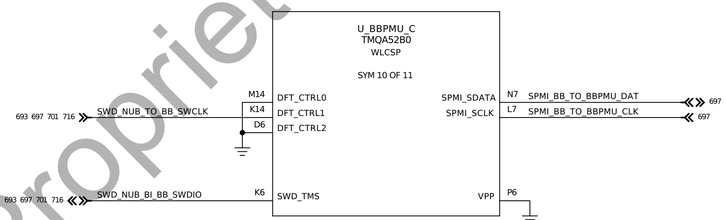
PRODUCT_ID

1.4K = V59
4.53K = D23
8.06K
12.1K
16.9K
22.1K
28.0K
34.8K
42.2K
51.1K
60.4K
71.5K
84.5K
97.6K
113K
130K
150K
174K
200K
226K
226K
255K

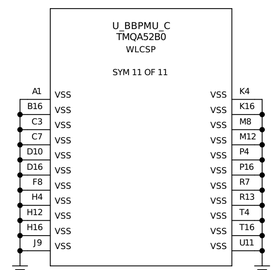
REVISION_ID

1.4K = PROTO0
4.53K = PROTO1
8.06K = PROTO2
12.1K = EVT
16.9K = CRB
22.1K = DVT
28.0K
34.8K
42.2K
51.1K
60.4K
71.5K
84.5K
97.6K
113K
130K
150K
174K
200K
226K
226K
255K

TEST

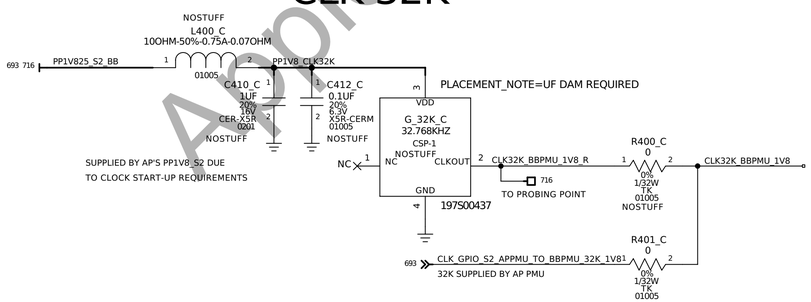


GND

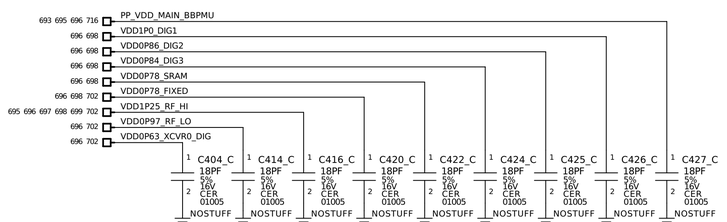


32K MEMS VIBRATION MITIGATION REMOVED

CLK 32K



DESENSE SHUNTS



PAGE TITLE

BBPMU (1/2) (4)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

INDUCTOR FOOTPRINT ALT

COMBO A

U_BBPMU_C
TMQA52B0
WLCSP
SYM 1 OF 11

PP_VDD_MAIN_BBPMU
693 695 696 716

VDD_MAIN_COMBOA: C17, C19, C21, G17, G19, G21, L17, L19, L21, R17, R19, R21

C500_C 13UF 20% 6.3V X5R 0402-3
C501_C 4UF 20% 6.3V CER-X5R 0201
C505_C 4UF 20% 6.3V CER-X5R 0201
C543_C 0.47UF 20% 6.3V X5R 01005-3
C502_C 0.47UF 20% 6.3V X5R 01005-3
C506_C 4UF 20% 6.3V CER-X5R 0201
C544_C 0.47UF 20% 6.3V X5R 01005-3
C545_C 0.47UF 20% 6.3V X5R 01005-3
C546_C 0.47UF 20% 6.3V X5R 01005-3
C547_C 0.47UF 20% 6.3V X5R 01005-3
C548_C 0.47UF 20% 6.3V X5R 01005-3
C549_C 0.47UF 20% 6.3V X5R 01005-3

BUCK0 13.7A
BUCK3 4.3A
BUCK1 3A
BUCK2 2.5A
BUCK4 1.5A

VSS_BUCK_COMBOA: A17, A19, A21, E17, E19, E21, J17, J19, J21, N17, N19, N21, U17, U19, U21

COMBOA_LX1: T18, T20
COMBOA_LX2: P18, P20
COMBOA_LX3: M18, M20
COMBOA_LX4: K18, K20
COMBOA_LX5: H18, H20
COMBOA_LX6: F18, F20
COMBOA_LX7: D18, D20
COMBOA_LX8: B18, B20
COMBOA_FB1: R15
COMBOA_FB2: N15
COMBOA_FB3: L15
COMBOA_FB4: J15
COMBOA_FB5: G15
COMBOA_FB6: E15

LX_BUCK0_PH0 — DIDT=TRUE — L500_C 0.22UH-20%-5.8A-0.04OHM 1608 — 152S00818 — VDD1P0_DIG1 695 696 698
LX_BUCK0_PH1 — DIDT=TRUE — L501_C 0.47UH-20%-4.9A-0.025OHM CIGT2016R6TB — 152S02018 — VDD1P25_RF_HI 695 696 697 698 699 702
LX_BUCK0_PH2 — DIDT=TRUE — LOWER_COIL_IN / UPPER_COIL_IN — L502_C 152S00897 MTFE2016-2SM 0.1UH-20%-6.1A-0.019OHM — LOWER_COIL_OUT / UPPER_COIL_OUT
LX_BUCK0_PH3 — DIDT=TRUE
LX_BUCK3 — DIDT=TRUE — L503_C 470NH-20%-5.6A-0.028OHM CIGT2016-SM1 — 152S02040 — VDD0P78_SRAM 695 696 698
LX_BUCK1 — DIDT=TRUE — L504_C 0.47UH-20%-4.9A-0.025OHM CIGT2016R6TB — 152S02018 — VDD0P86_DIG2 695 696 698
LX_BUCK2 — DIDT=TRUE — L505_C 0.47UH-20%-4.9A-0.025OHM CIGT2016R6TB — 152S02018 — VDD0P84_DIG3 695 696 698
LX_BUCK4 — DIDT=TRUE — L506_C 0.47UH-20%-2.8A-0.067OHM 1210 — 152S00854 — VDD0P78_FIXED 695 696 698 702

C515_C 16UF 20% 4V X5R 0402-0.1MM-1
C518_C 16UF 20% 4V X5R 0402-0.1MM-1
C521_C 16UF 20% 4V X5R 0402-0.1MM-1
COMBO A Z=0.65MM

C509_C 16UF 20% 3V X5R 0402-0.1MM-1
C511_C 16UF 20% 4V X5R 0402-0.1MM-1
C513_C 16UF 20% 4V X5R 0402-0.1MM-1
C516_C 16UF 20% 3V X5R 0402-0.1MM-1
C519_C 16UF 20% 4V X5R 0402-0.1MM-1
C522_C 16UF 20% 4V X5R 0402-0.1MM-1
C524_C 16UF 20% 4V X5R 0402-0.1MM-1
C525_C 16UF 20% 4V X5R 0402-0.1MM-1

XW509_C SHORT-12L-0.1MM-SM
XW505_C SHORT-12L-0.1MM-SM — VDD1P0_DIG1 — PLACE_NEAR=U_BB_C:1MM — 695 696 698
XW501_C SHORT-12L-0.1MM-SM — VDD0P78_SRAM — PLACE_NEAR=U_BB_C:1MM — 695 696 698
XW506_C SHORT-12L-0.1MM-SM — VDD0P86_DIG2 — PLACE_NEAR=U_BB_C:1MM — 695 696 698
VDD0P84_DIG3 — 695 696 698
XW502_C SHORT-12L-0.1MM-SM — VDD0P78_FIXED — 695 696 698 702

NO_XNET_CONNECTION

REMOVED

No smaller footprint alt after EVT

Removed 152S01851 since EOL

0.5mm x 1.6mm — 0.6mm x 1.6mm

COMBO B

U_BBPMU_C
TMQA52B0
WLCSP
SYM 2 OF 11

PP_VDD_MAIN_BBPMU
693 695 696 716

VDD_MAIN_COMBOB_C: G1, G3, L1, L3, R1, R3

C503_C 13UF 20% 6.3V X5R 0402-3
C507_C 4UF 20% 6.3V CER-X5R 0201
C553_C 0.47UF 20% 6.3V X5R 01005-3
C504_C 0.47UF 20% 6.3V X5R 01005-3
C508_C 0.47UF 20% 6.3V X5R 01005-3

BUCK6 2.8A
BUCK7 2A
BUCK8 1.8A

VSS_BUCK_COMBOB_C: J1, J3, N1, N3, U1, U3

COMBOB_LX1: T2 — NC
COMBOB_LX2: P2
COMBOB_LX3: M2
COMBOB_LX4: K2
COMBOC_LX1: H2 — NC
COMBOB_FB1: R5
COMBOB_FB2: N5
COMBOB_FB3: L5
COMBOB_FB4: J5
COMBOC_FB1: G5

LX_BUCK6 — DIDT=TRUE — L508_C 0.47UH-20%-4.9A-0.025OHM CIGT2016R6TB — 152S02018 — VDD1P25_RF_HI 695 696 697 698 699 702
LX_BUCK7 — DIDT=TRUE — L509_C 1UH-20%-3.6A-0.068OHM PIPF2016FE-SM — 152S01525 — VDD0P97_RF_LO 695 696 702
LX_BUCK8 — DIDT=TRUE — L510_C 0.47UH-20%-3.5A-0.055OHM 0603 — 152S01532 — VDD0P63_XCVR0_DIG 695 696 702

C510_C 16UF 20% 4V X5R 0402-0.1MM-1
C512_C 16UF 20% 4V X5R 0402-0.1MM-1
C514_C 16UF 20% 4V X5R 0402-0.1MM-1
C542_C 16UF 20% 4V X5R 0402-0.1MM-1
C517_C 16UF 20% 4V X5R 0402-0.1MM-1
C520_C 16UF 20% 4V X5R 0402-0.1MM-1
C554_C 16UF 20% 4V X5R 0402-0.1MM-1
COMBO B Z=0.65MM

XW503_C SHORT-12L-0.1MM-SM
XW507_C SHORT-12L-0.1MM-SM — VDD1P25_RF_HI — 695 696 697 698 699 702
XW504_C SHORT-12L-0.1MM-SM — VDD0P97_RF_LO — 695 696 702
VDD0P63_XCVR0_DIG — 695 696 702 — PLACE_NEAR=U_CARPO_C:1MM

NO_XNET_CONNECTION

LDOS

U_BBPMU_C
TMQA52B0
WLCSP
SYM 4 OF 11

PP1V825_S4_BB — 693 695 696 716 — A7 VDD_1V8_1
VDD1P25_RF_HI — 695 696 697 698 699 702 — B2 VDD_1V25_1
VDD3P4_BOOST — 695 696 — B4 VDD_BOOST_1

LDO0 150MA — A5 VLDO0 — VDD3P15_VFE_HI — 693 705 706 708 709 713
LDO1 20MA — B6 VLDO1 — VDD1P5_MEMS — 700
LDO4 400MA — A3 VLDO4 — VDD1P12_VFE_LO — 693 705 706 707 709 710 711 712
BUCK6_SW1 — C1 — VDD_RFFE_VIO — 693 703 705 706 707 708 709 710 711 713 716

C526_C 4UF 20% 6.3V CER-X5R 0201
C528_C 4UF 20% 6.3V CER-X5R 0201
C525_C 1UF 20% 16V CER-X5R 0201
C532_C 4UF 20% 6.3V CER-X5R 0201
C534_C 4UF 20% 6.3V CER-X5R 0201
C536_C 10UF 20% 10V X5R-CERM 0402-0.1MM
C523_C 0.1UF 20% 6.3V X5R-CERM 01005

SUPPRESSES OVERSHOOT DURING SWITCH TURN ON

LDOS

U_BBPMU_C
TMQA52B0
WLCSP
SYM 5 OF 11

VDD1P25_RF_HI — 695 696 697 698 699 702 — U7 VDD_1V25_2 / T10 VDD_1V25_3
PP1V825_S4_BB — 693 695 696 716 — R11 VDD_1V8_3 / T12 VDD_1V8_4
VDD3P4_BOOST — 695 696 — N11 VDD_BOOST_2
VDD0P78_FIXED — 695 696 698 702 — T14 VDD_LDO3

LDO2 550MA — U9 VLDO2 — VDD1P1 — 698
LDO2 30MA — T8 VLDO5 — VDD0P72_LOW — 698
BUCK6_SW0 — T6 — NC
LDO SIM1 60MA — P10 VLDO_SIM1 — PP_VDD_SIM0 — 693 698 716
LDO SIM2 60MA — P12 VLDO_SIM2 — PP_VDD_SIM1 — 693 698
LDO3 200MA — U15 VLDO3 — VDD0P6_VDD0L — 697 698
BUCK9_SW0 — U13 — VDD1P8 — 698 699

C527_C 4UF 20% 6.3V CER-X5R 0201
C529_C 4UF 20% 6.3V CER-X5R 0201
C530_C 4UF 20% 6.3V CER-X5R 0201
C533_C 4UF 20% 6.3V CER-X5R 0201
C537_C 0.47UF 20% 6.3V X5R 01005-3 — 138S00412
C540_C 0.47UF 20% 6.3V X5R 01005-3 — 138S00412
C538_C 4UF 20% 6.3V CER-X5R 0201
C539_C 4UF 20% 6.3V CER-X5R 0201

BOOST

U_BBPMU_C
TMQA52B0
WLCSP
SYM 3 OF 11

PP_VDD_MAIN_BBPMU — 693 695 696 716 — L511_C 0.47UH-20%-1.7A-0.175OHM PIJT1005FE-SM 152S00874 — LX_BOOST — E1 BSTLQ_LX
BSTLQ_VOUT — F2 — VDD3P4_BOOST
BSTLQ_FB — E3 — BSTLQ_FB — SHORT-12L-0.1MM-SM XW500_C — 695 696
VSS_BSTLQ — D2

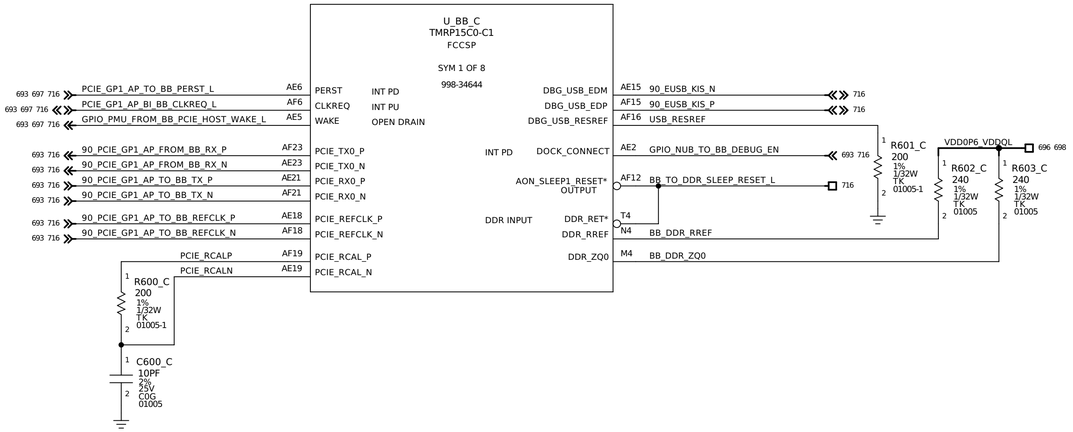
C541_C 4UF 20% 6.3V CER-X5R 0201
C531_C 16UF 20% 4V MATERIAL=X5R 0402-0.1MM-1 Z=0.65MM

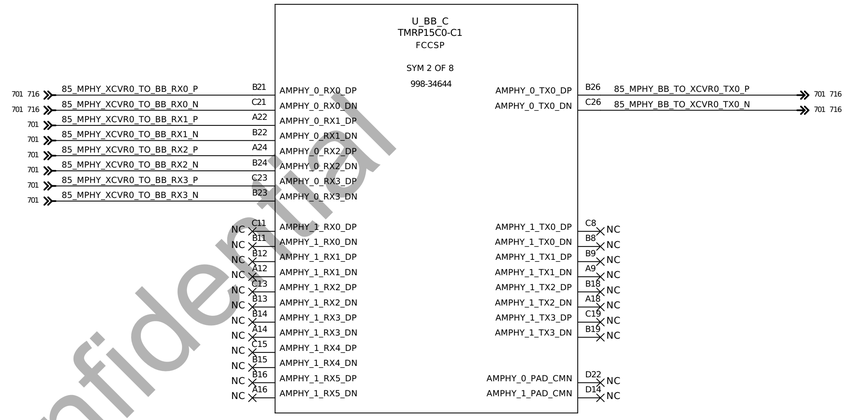
Apple Proprietary and Confidential

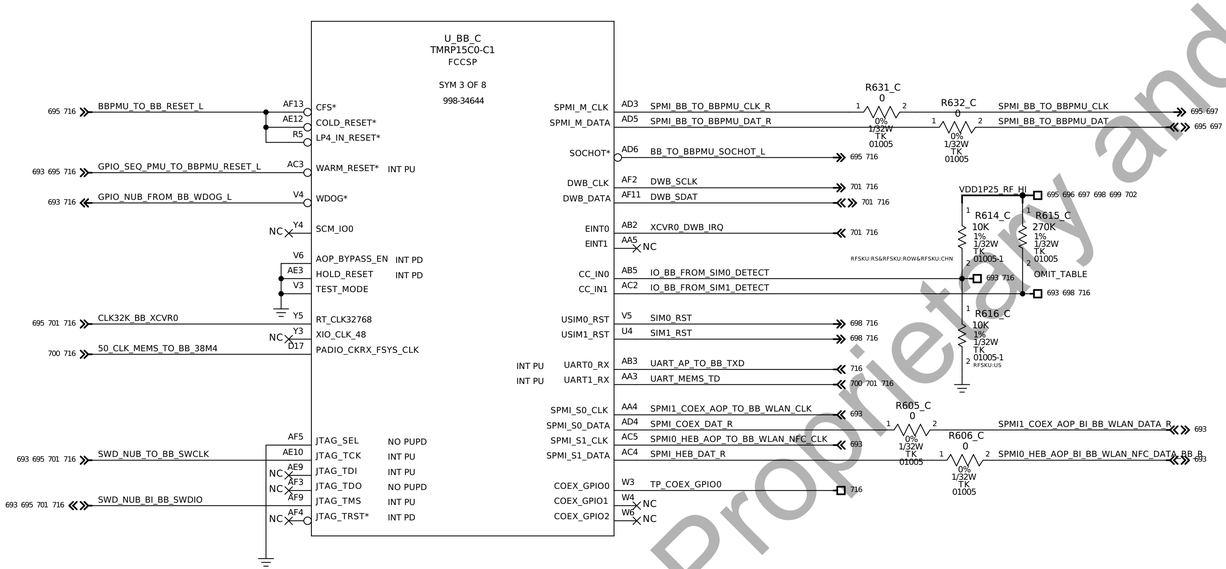
PAGE TITLE
BBPMU (2/2) (5)

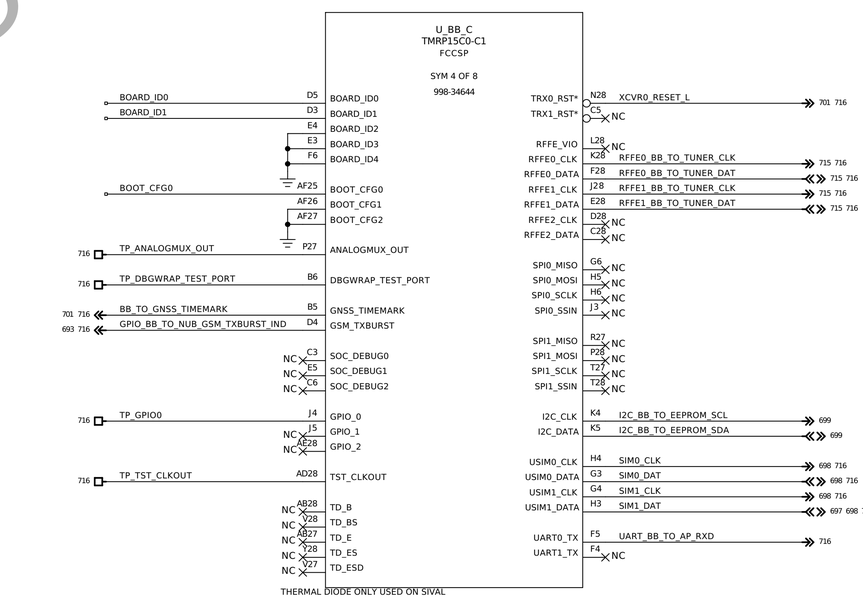
Apple Inc.

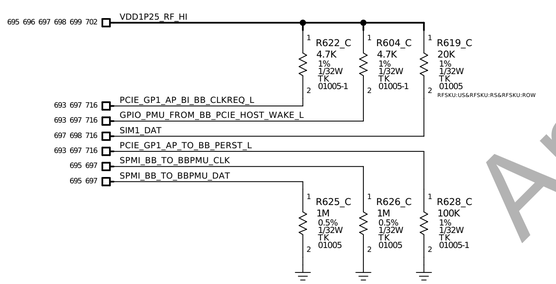
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

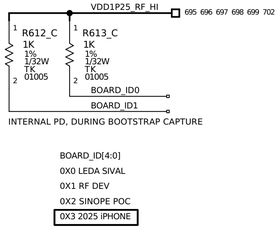


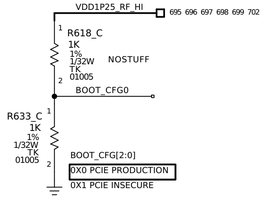












PAGE TITLE

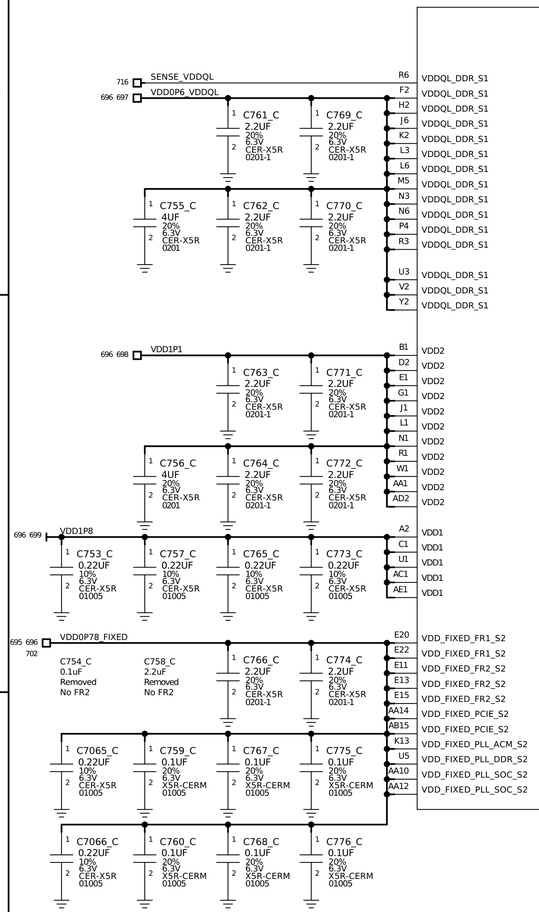
BASEBAND (1/3) (6)

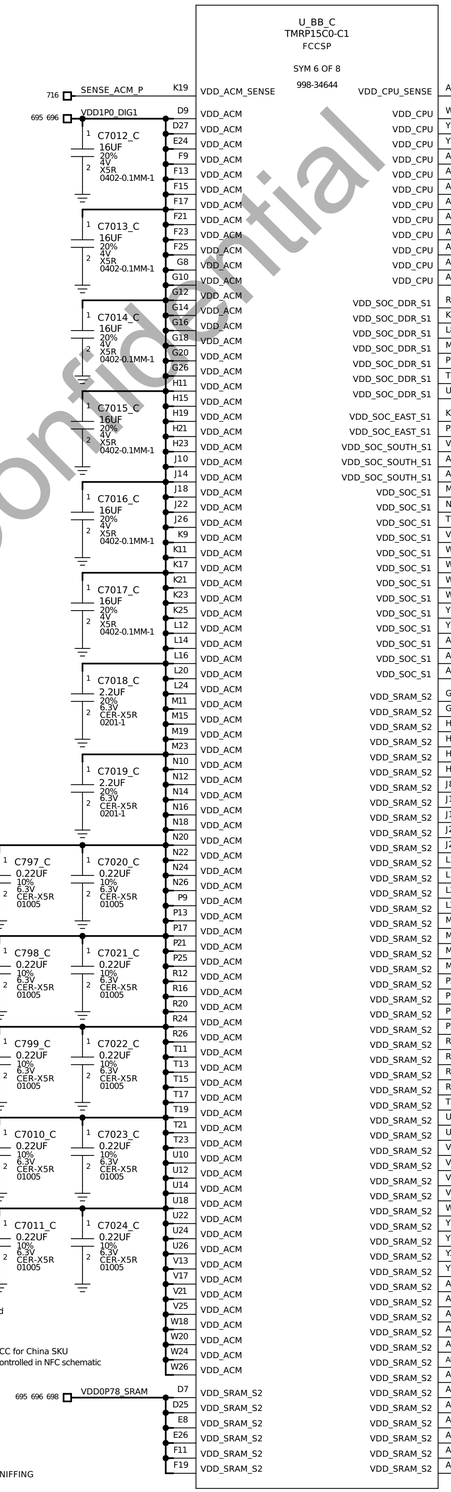
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

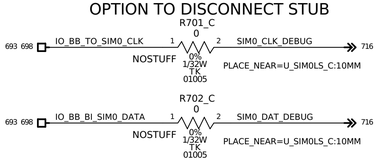
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

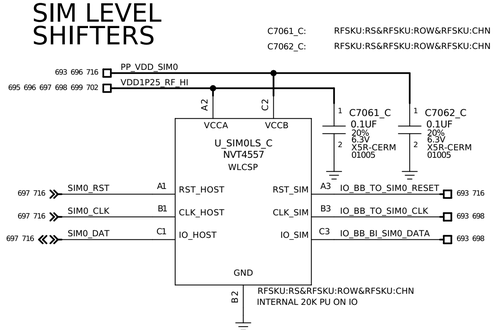


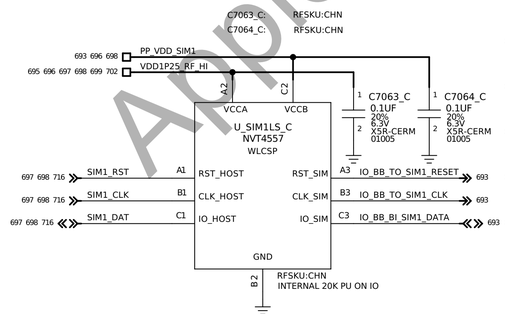


OPTION TO DISCONNECT STUB

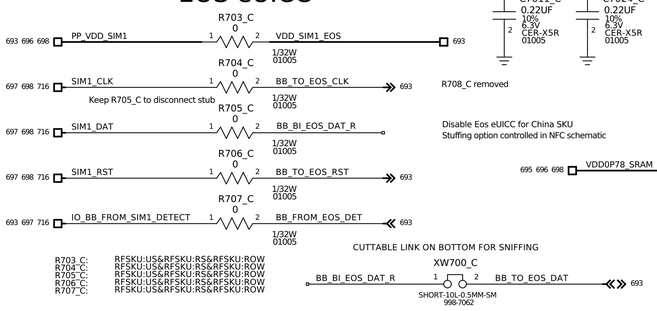


SIM LEVEL SHIFTERS





EOS eUICC



Apple Proprietary and Confidential

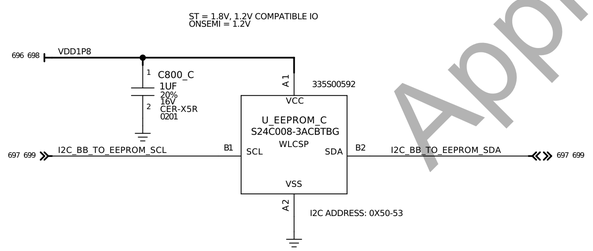
PAGE TITLE
BASEBAND (2/3) (7)

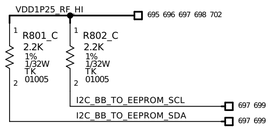
Apple Inc.

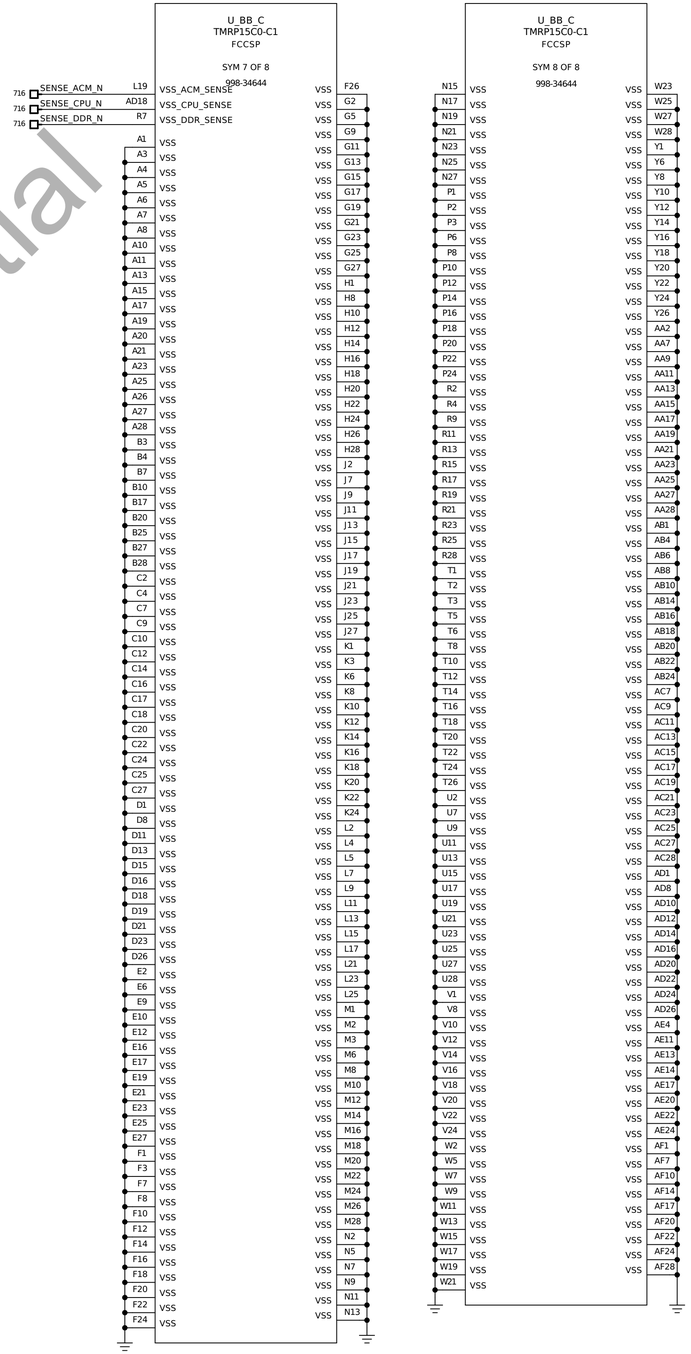
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

BB EEPROM







PAGE TITLE

BASEBAND (3/3) (8)

Apple Inc.

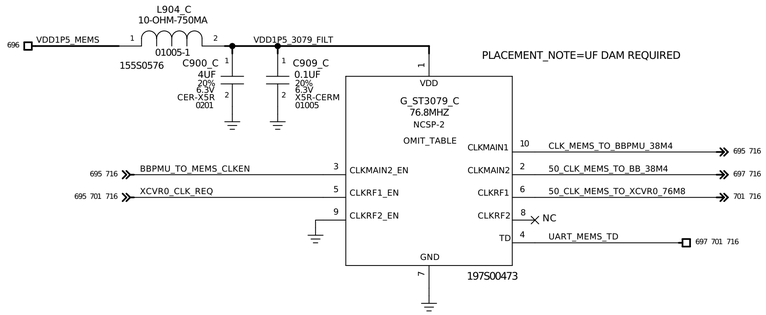
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

CLOCKING

PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
197S00457	SIT3079PKG:SMALL	G_ST3079_C	CRITICAL	1	OSC,MEMS,76.8MHZ,4-OUT,CSP10
197S00473	SIT3079PKG:LARGE	G_ST3079_C	CRITICAL	1	OSC,MEMS,76.8MHZ,4-OUT,CSP10

MEMS SIT3079



Apple Proprietary and Confidential

PAGE TITLE

CLOCKING (9)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:

I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE

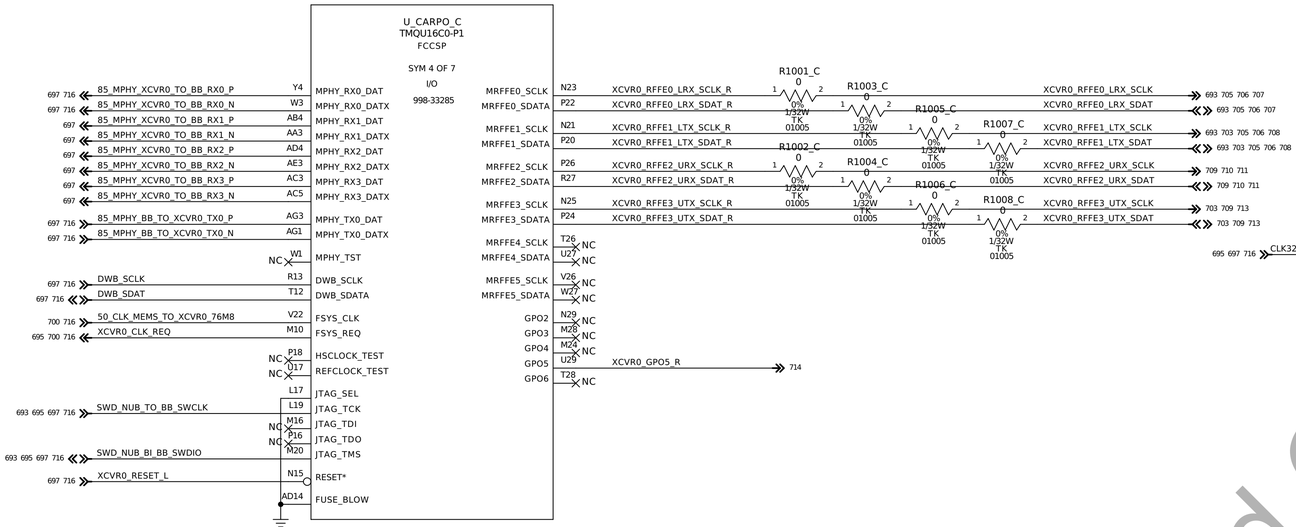
II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART

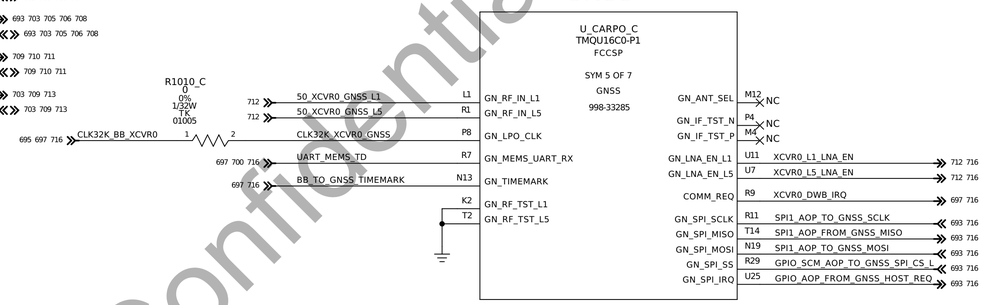
IV ALL RIGHTS RESERVED

Apple Proprietary and Confidential

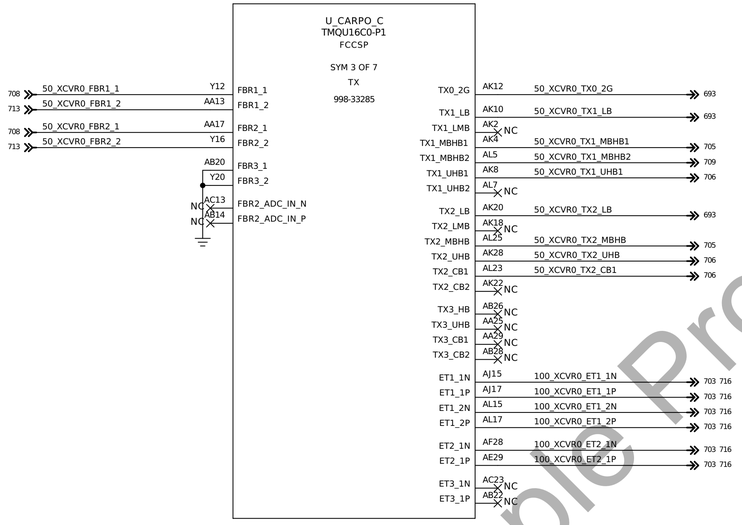
CONTROL



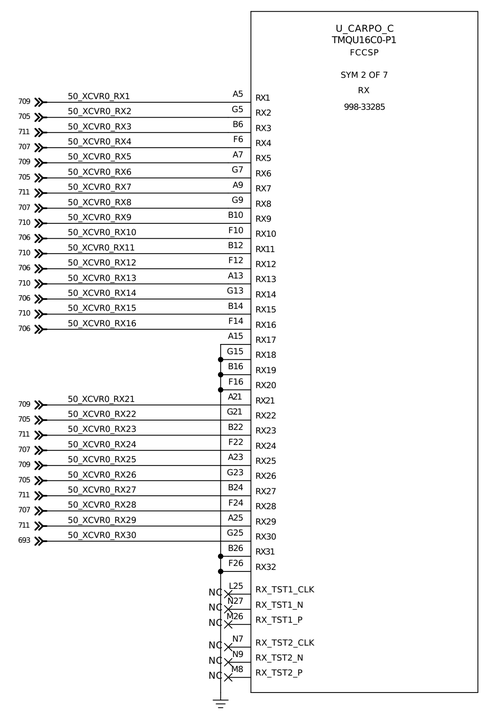
GNSS



TX



RX



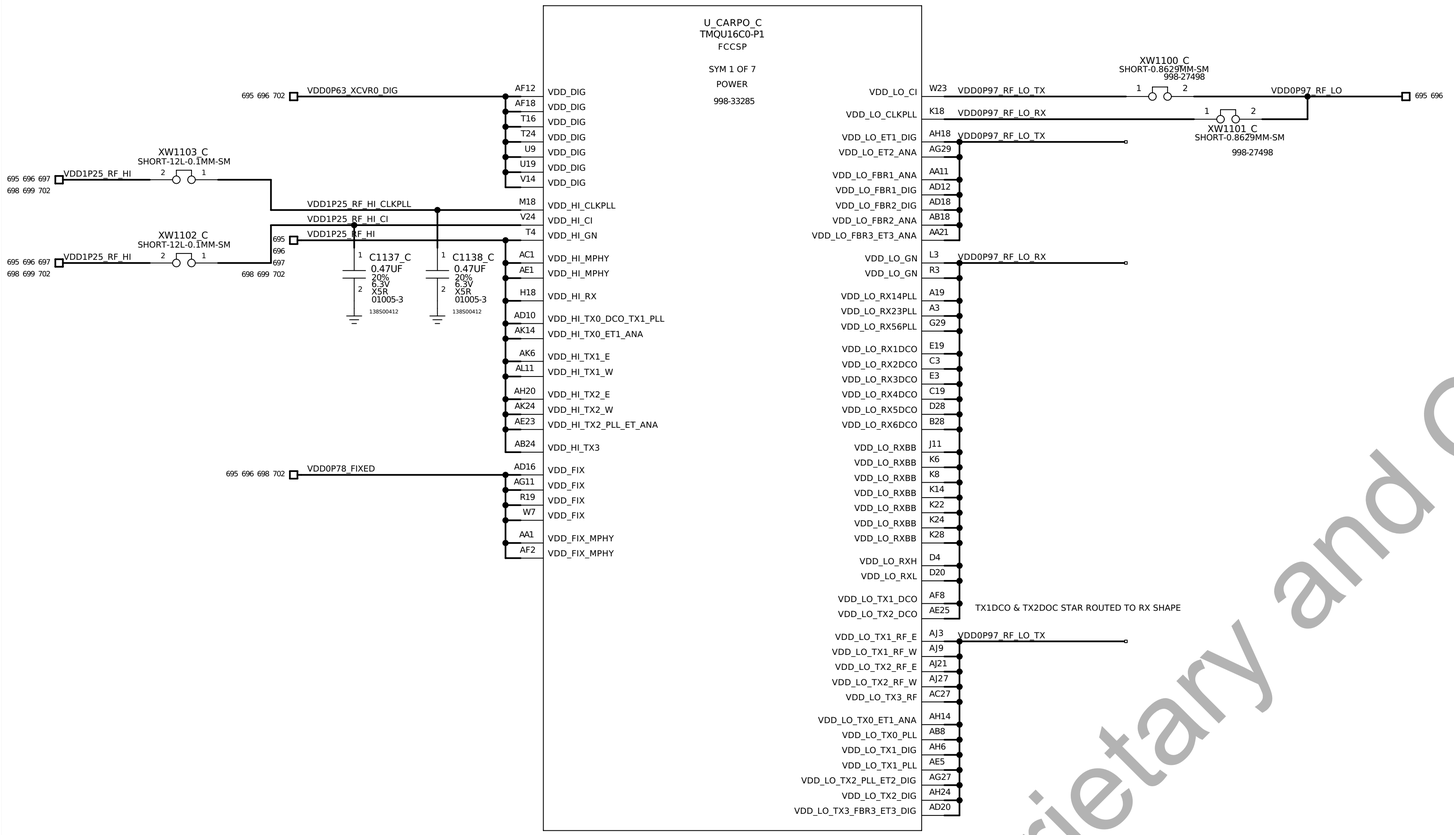
PAGE TITLE

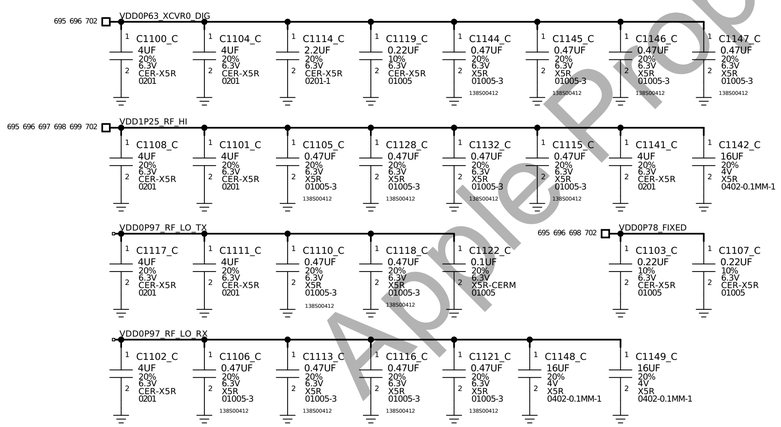
Apple Inc.

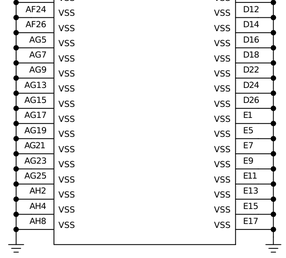
NOTICE OF PROPRIETARY PROPERTY:

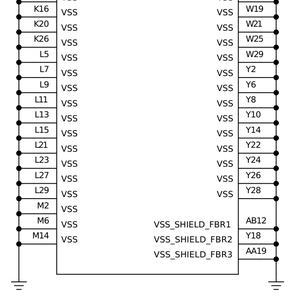
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

POWER









Apple Proprietary and Confidential

PAGE TITLE

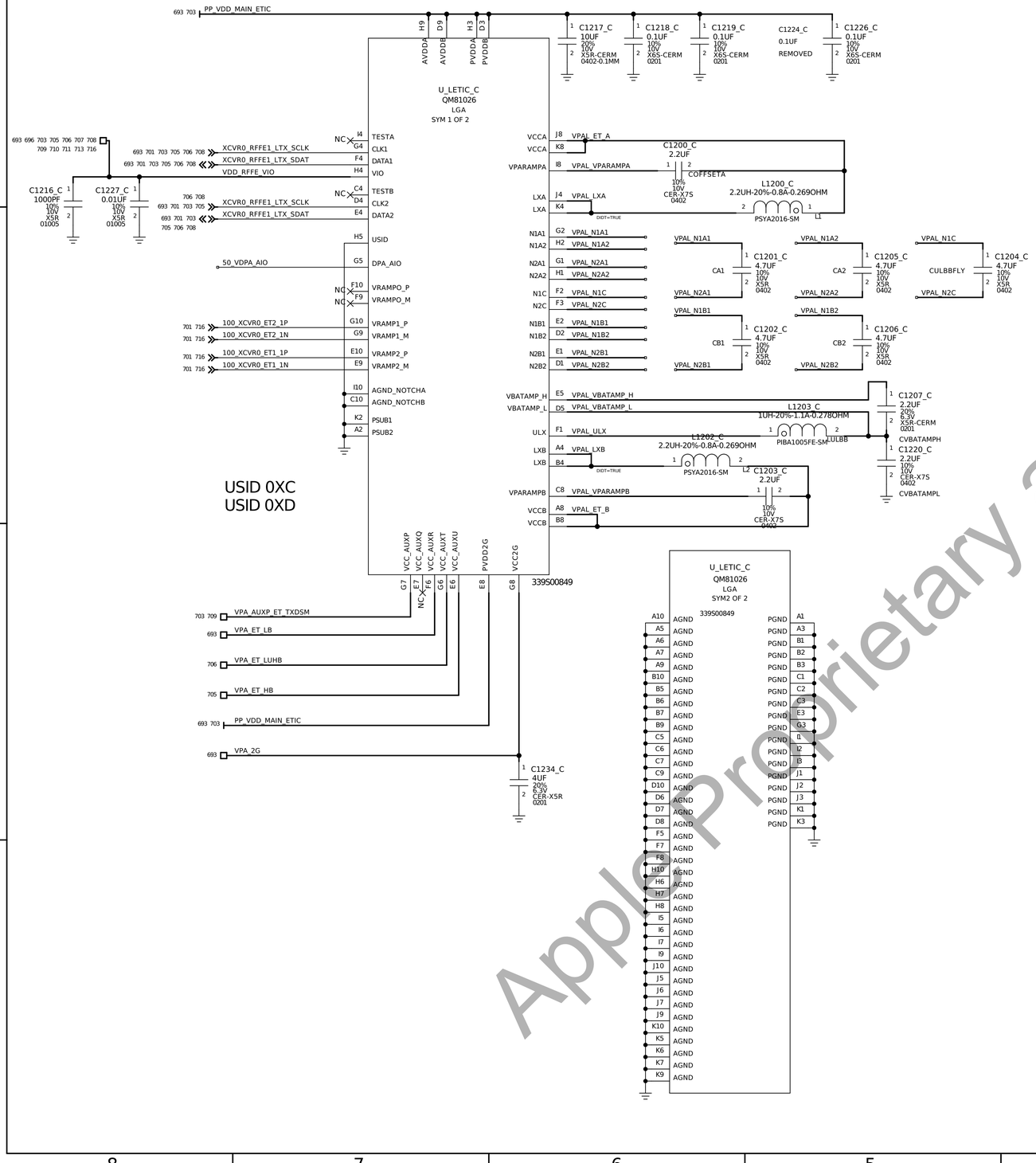
POWER (11)

Apple Inc.

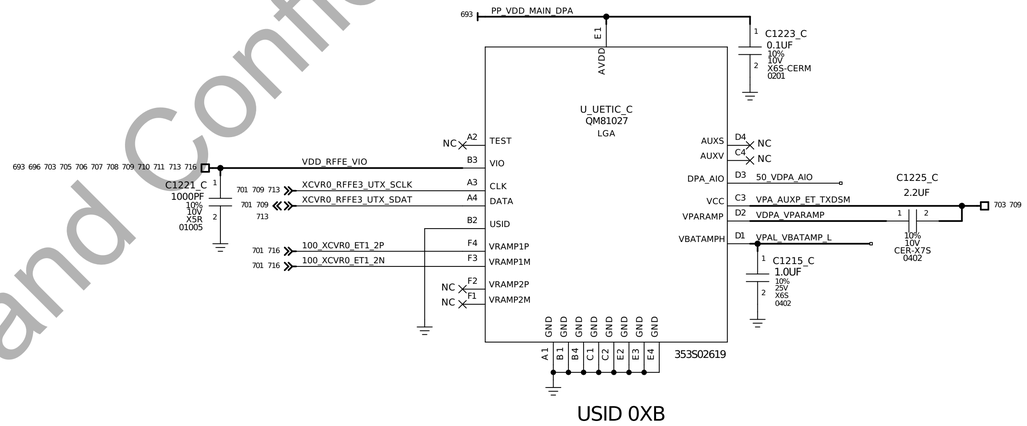
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

LAT


693 703 PP_VDD_MAIN_ETIC
AVDDA H9
AVDDB D9
PVDDA H3
PVDDB D3
C1217_C 10UF 20% 10V X5R-CERM 0402-0.1MM
C1218_C 0.1UF 10% 10V X6S-CERM 0201
C1219_C 0.1UF 10% 10V X6S-CERM 0201
C1224_C 0.1UF REMOVED
C1226_C 0.1UF 10% 10V X6S-CERM 0201
U_LETIC_C QM81026 LGA SYM 1 OF 2
693 696 703 705 706 707 708 709 710 711 713 716
C1216_C 1000PF 10% 10V X5R 01005
C1227_C 0.01UF 10% 10V X5R 01005
NC I4 TESTA
CLK1 G4 XCVR0_RFFE1_LTX_SCLK
DATA1 F4 XCVR0_RFFE1_LTX_SDAT
VIO H4 VDD_RFFE_VIO
NC C4 TESTB
CLK2 D4 XCVR0_RFFE1_LTX_SCLK
DATA2 E4 XCVR0_RFFE1_LTX_SDAT
USID H5
50_VDPA_AIO G5 DPA_AIO
NC F10 VRAMPO_P
NC F9 VRAMPO_M
701 716 100_XCVR0_ET2_1P G10 VRAMP1_P
701 716 100_XCVR0_ET2_1N G9 VRAMP1_M
701 716 100_XCVR0_ET1_1P E10 VRAMP2_P
701 716 100_XCVR0_ET1_1N E9 VRAMP2_M
I10 AGND_NOTCHA
C10 AGND_NOTCHB
K2 PSUB1
A2 PSUB2
USID 0XC
USID 0XD
VCCA J8 VPAL_ET_A
VCCA K8
VPARAMPA I8 VPAL_VPARAMPA
C1200_C 2.2UF 10% 10V CER-X7S 0402 COFFSETA
LXA J4 VPAL_LXA
LXA K4
DIDT=TRUE
L1200_C 2.2UH-20%-0.8A-0.269OHM PSYA2016-SM L1
N1A1 G2 VPAL_N1A1
N1A2 H2 VPAL_N1A2
N2A1 G1 VPAL_N2A1
N2A2 H1 VPAL_N2A2
N1C F2 VPAL_N1C
N2C F3 VPAL_N2C
N1B1 E2 VPAL_N1B1
N1B2 D2 VPAL_N1B2
N2B1 E1 VPAL_N2B1
N2B2 D1 VPAL_N2B2
VPAL_N1A1 C1201_C 4.7UF 10% 10V X5R 0402 CA1 VPAL_N2A1
VPAL_N1A2 C1205_C 4.7UF 10% 10V X5R 0402 CA2 VPAL_N2A2
VPAL_N1C C1204_C 4.7UF 10% 10V X5R 0402 CULBBFLY VPAL_N2C
VPAL_N1B1 C1202_C 4.7UF 10% 10V X5R 0402 CB1 VPAL_N2B1
VPAL_N1B2 C1206_C 4.7UF 10% 10V X5R 0402 CB2 VPAL_N2B2
VBATAMP_H E5 VPAL_VBATAMP_H
VBATAMP_L D5 VPAL_VBATAMP_L
ULX F1 VPAL_ULX
L1203_C 1UH-20%-1.1A-0.278OHM PIBA1005FE-SM LULBB
C1207_C 2.2UF 20% 6.3V X5R-CERM 0201
C1220_C 2.2UF 10% 10V CER-X7S 0402
CVBATAMPH
CVBATAMPL
LXB A4 VPAL_LXB
LXB B4
DIDT=TRUE
L2202_C 2.2UH-20%-0.8A-0.269OHM PSYA2016-SM
C1203_C 2.2UF 10% 10V CER-X7S 0402
VPARAMPB C8 VPAL_VPARAMPB
VCCB A8 VPAL_ET_B
VCCB B8
VCC_AUXP G7
VCC_AUXQ E7
VCC_AUXR NC F6
VCC_AUXT G6
VCC_AUXU E6
PVDD2G E8
VCC2G G8
339S00849
703 709 VPA_AUXP_ET_TXDSM
693 VPA_ET_LB
706 VPA_ET_LUHB
705 VPA_ET_HB
693 703 PP_VDD_MAIN_ETIC
693 VPA_2G
C1234_C 4UF 20% 6.3V CER-X5R 0201
U_LETIC_C QM81026 LGA SYM 2 OF 2 339S00849
AGND A10 A5 A6 A7 A9 B10 B5 B6 B7 B9 C5 C6 C7 C9 D10 D6 D7 D8 F5 F7 F8 H10 H6 H7 H8 I5 I6 I7 I9 J10 J5 J6 J7 J9 K10 K5 K6 K7 K9
PGND A1 A3 B1 B2 B3 C1 C2 C3 E3 G3 I1 I2 I3 J1 J2 J3 K1 K3

UAT DPA



Apple Proprietary and Confidential

PAGE TITLE

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

LB+2G SPAD

HIER_RADIO_S_CG

Apple Proprietary and Confidential

PAGE TITLE

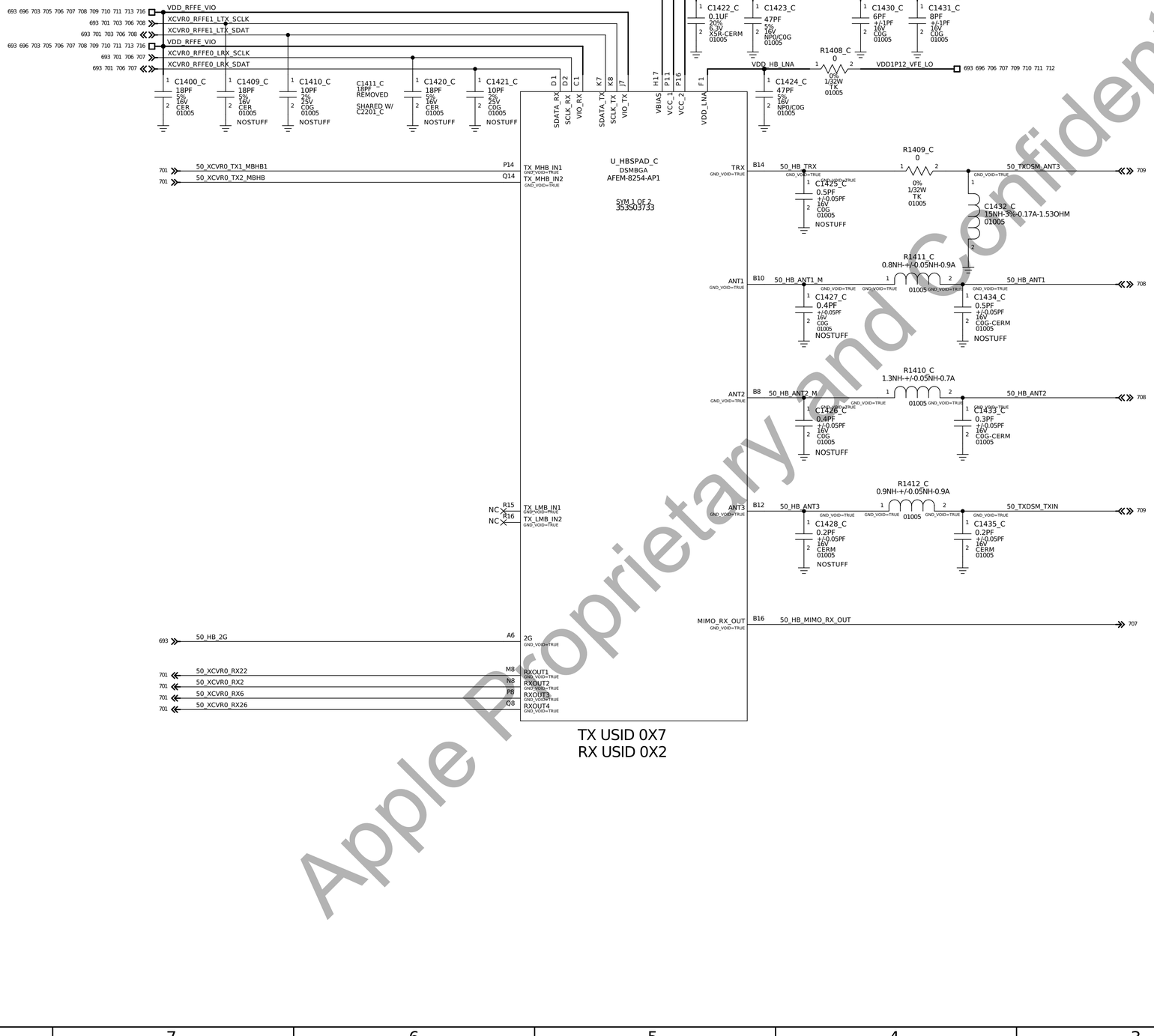
FR1 LAT LB/2G SPAD (13)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

HB SPAD



Apple Proprietary and Confidential

PAGE TITLE

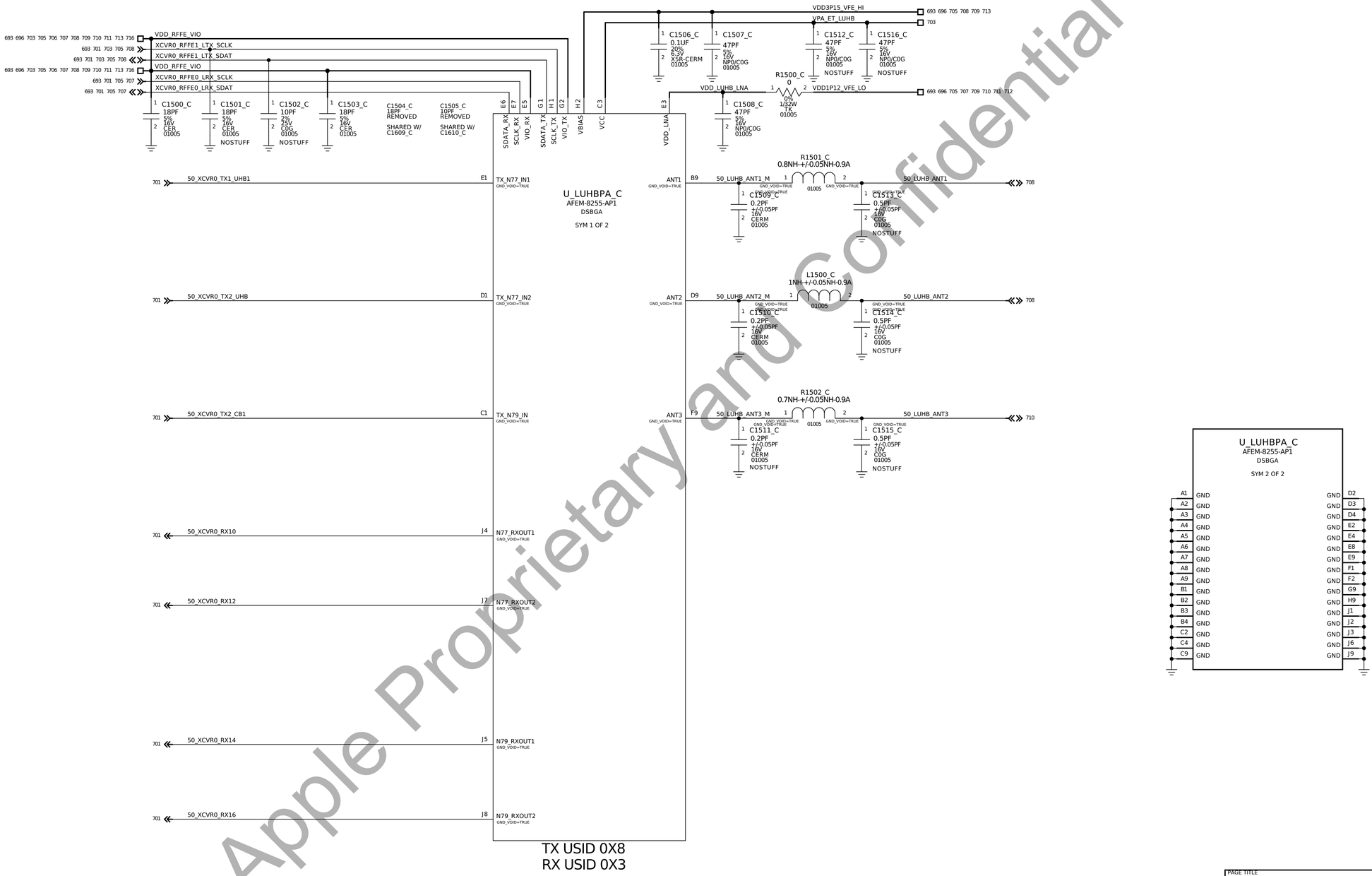
FR1 LAT HB SPAD (14)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 LAT UHB SPAD



Apple Proprietary and Confidential

PAGE TITLE

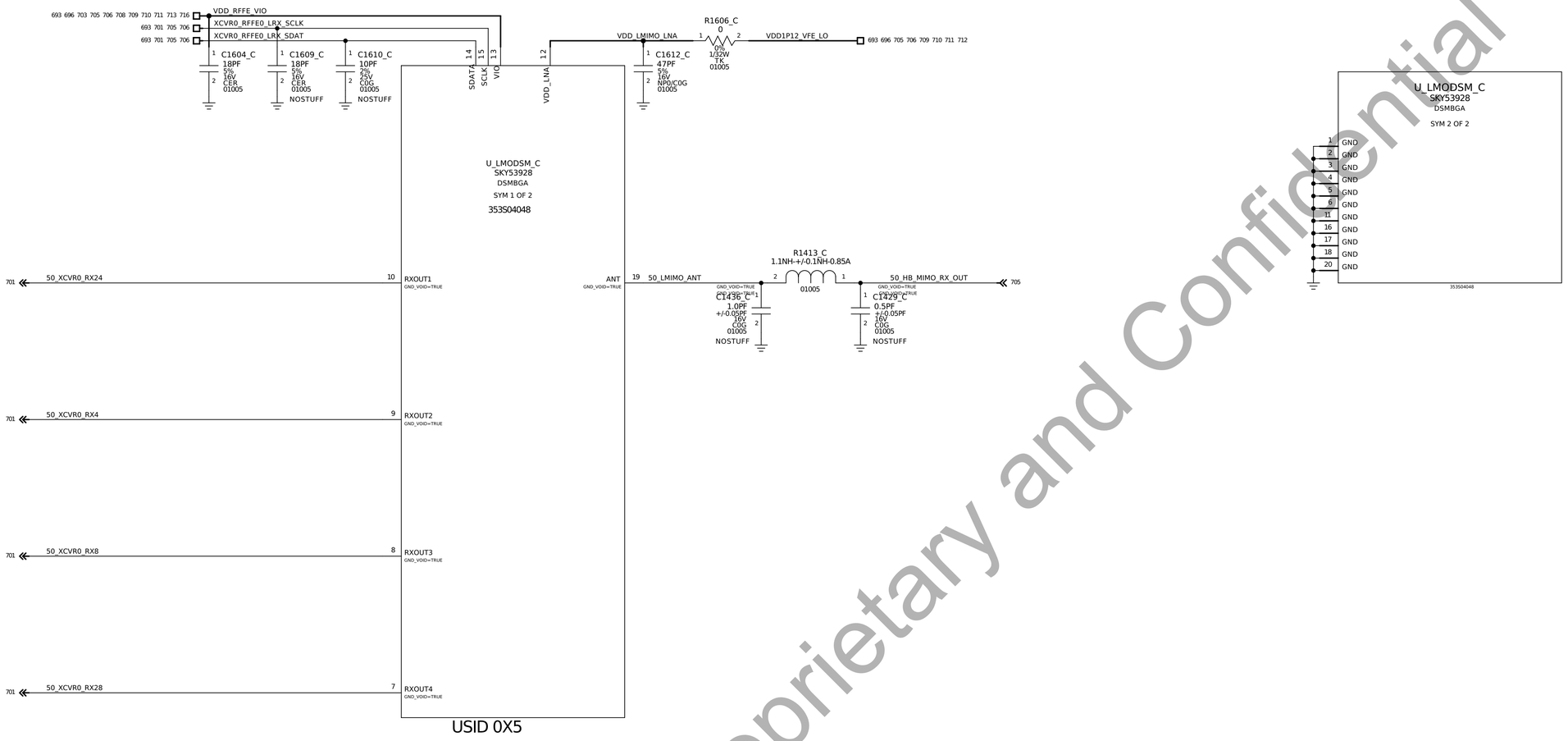
FR1 LAT UHB SPAD (15)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 LAT MIMO DSM



USID 0X5

Apple Proprietary and Confidential

PAGE TITLE

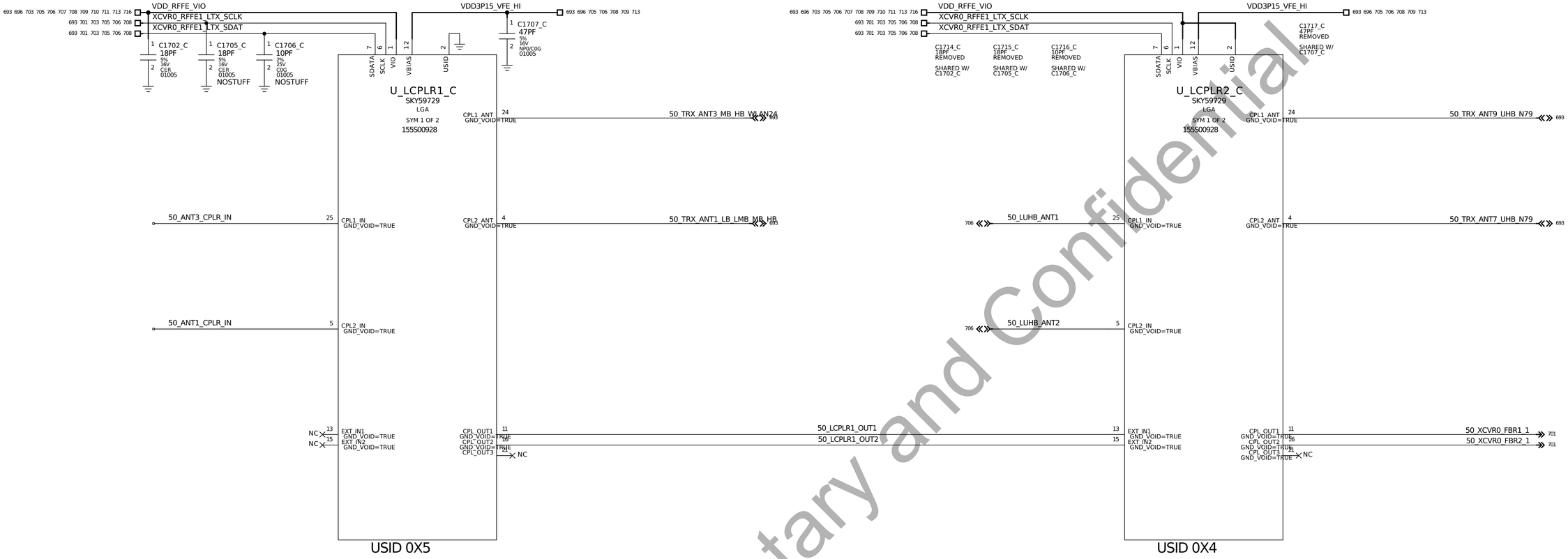
FR1 LAT MIMO DSM (16)

Apple Inc.

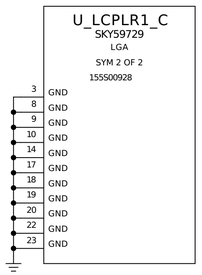
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

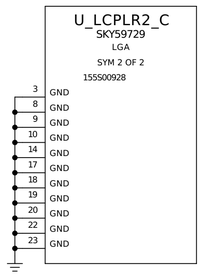
FR1 LAT COUPLERS



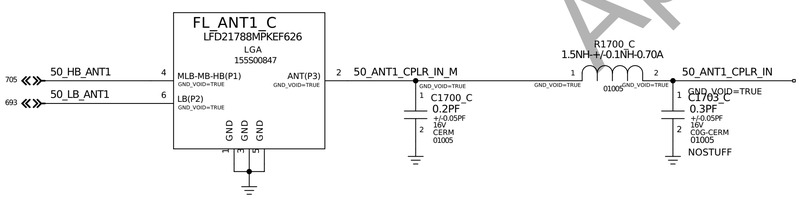
DUAL COUPLER



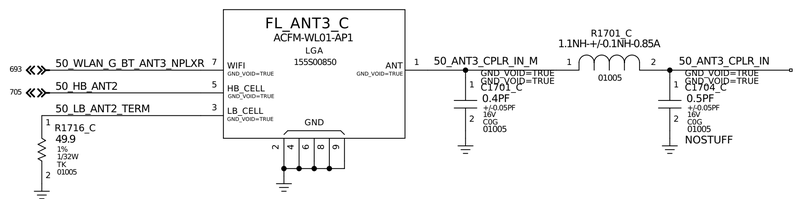
DUAL COUPLER



ANT1 DIPLEXER



ANT3 DIPLEXER



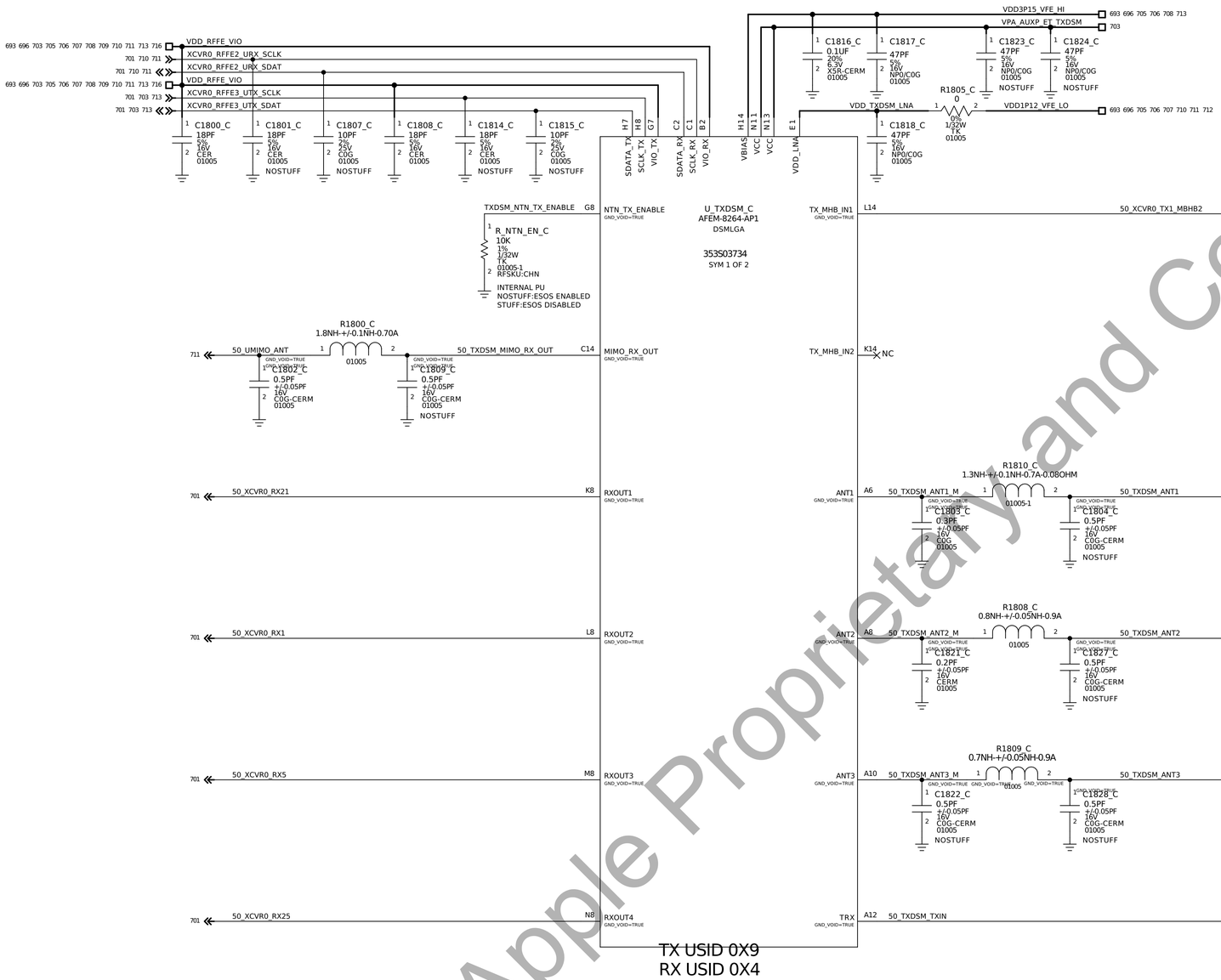
Apple Proprietary and Confidential

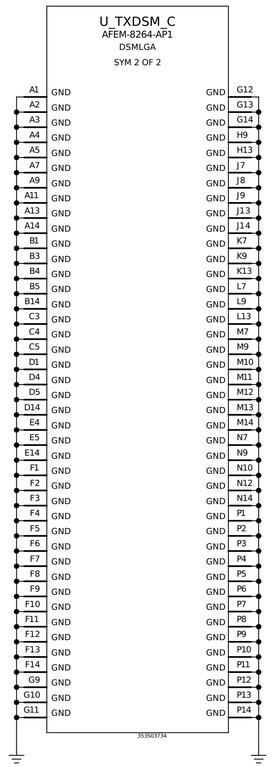
PAGE TITLE
FR1 LAT COUPLERS (17)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 UAT TX DSM





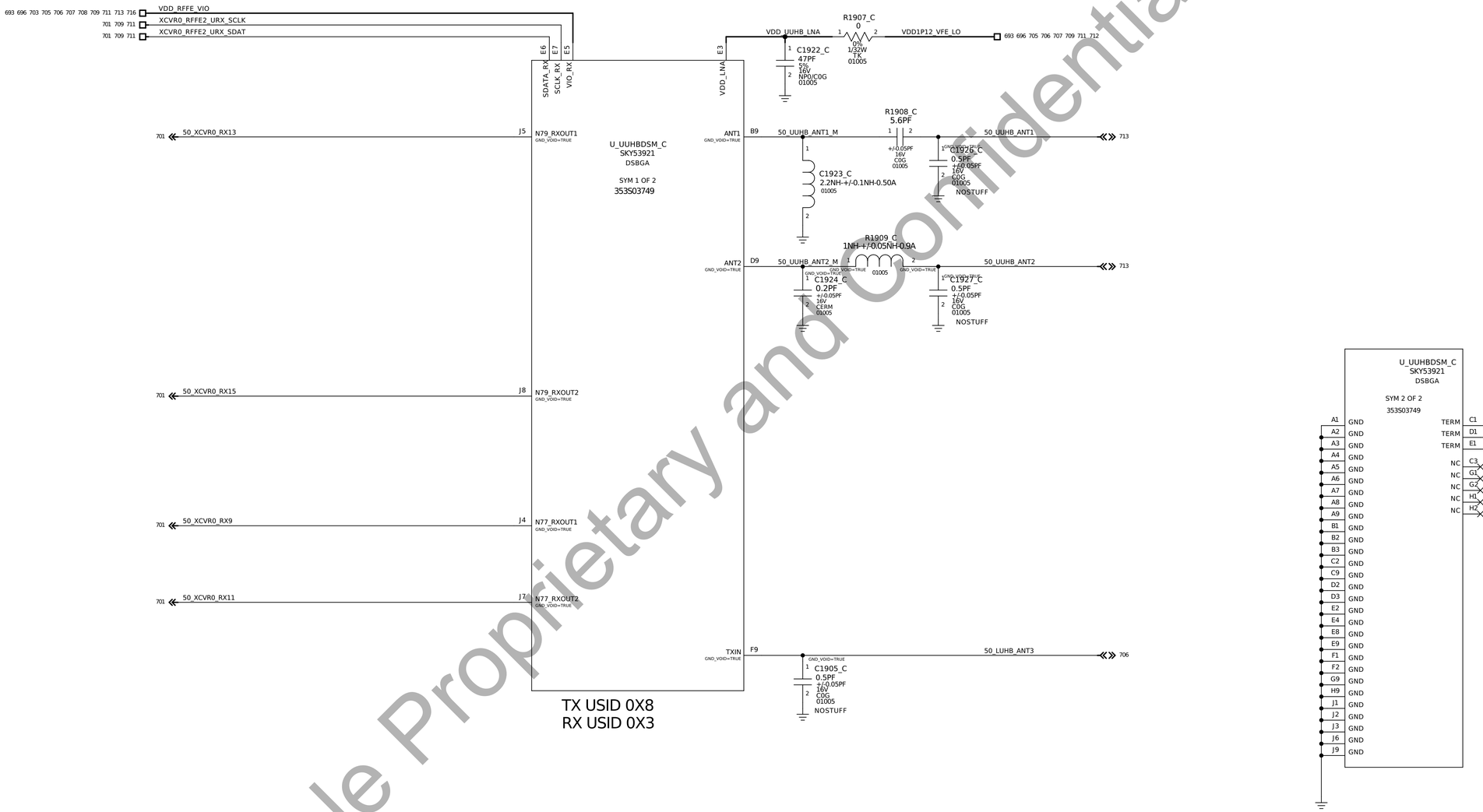
Apple Proprietary and Confidential

PAGE TITLE
FR1 UAT TX DSM (18)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 UAT UHB DSM



Apple Proprietary and Confidential

PAGE TITLE

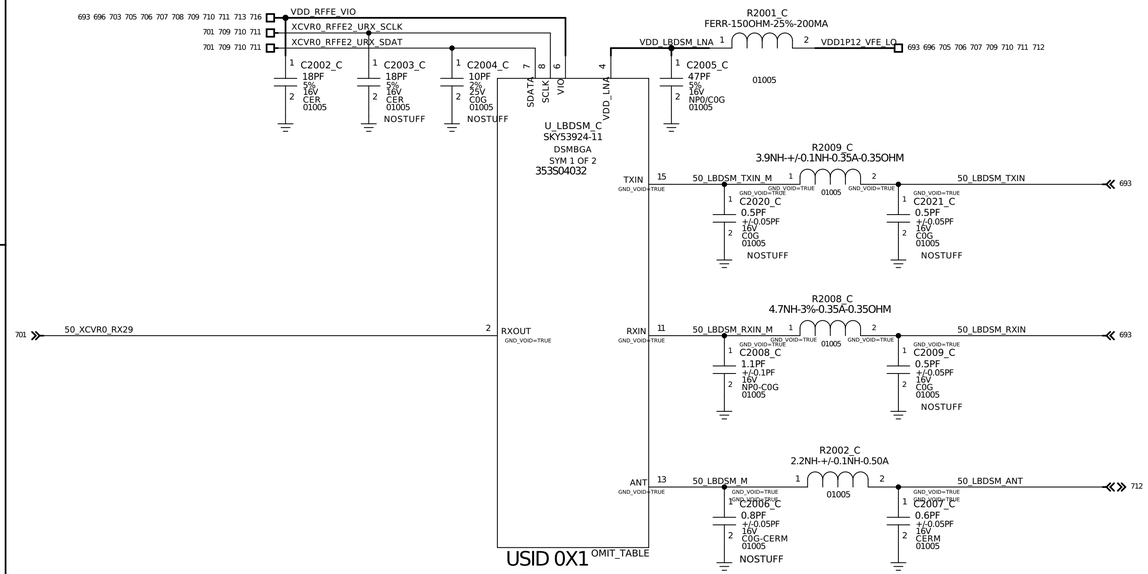
FR1 UAT UHB DSM (19)

Apple Inc.

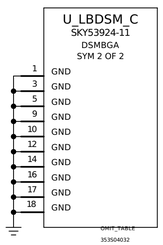
NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 UAT RX (1/2)

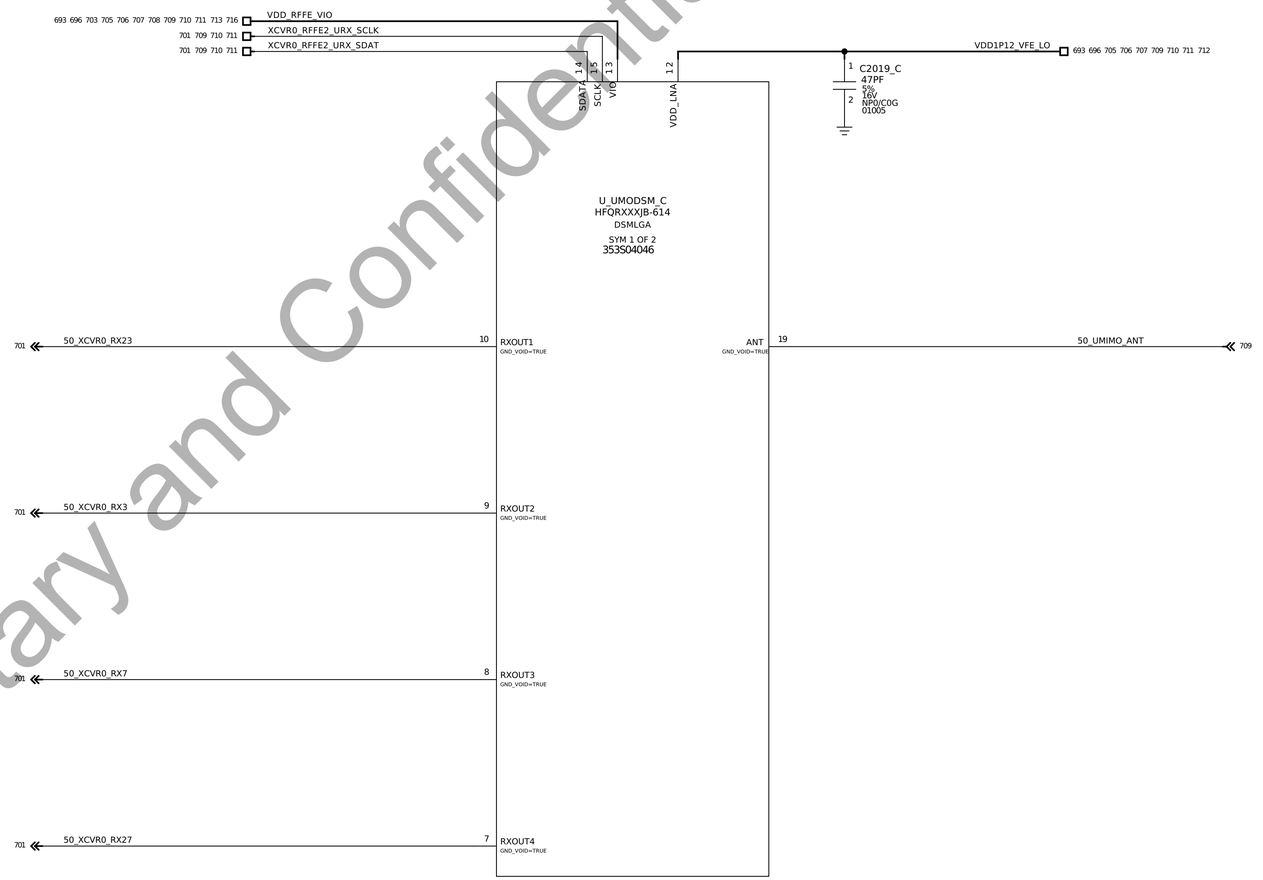


LB DSM



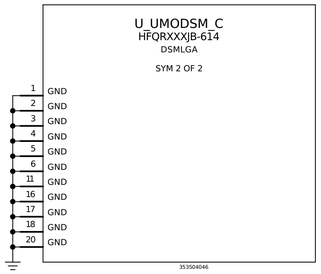
LB DSM RF SKU

	PART NUMBER	BOMOPTION	REFERENCE DESIGNATORS	CRITICAL	QTY	DESCRIPTION
WW SKU	353S04032	RFSKU:US	U_LBDSM_C	CRITICAL	1	IC,DSM,LB,SKY53924,DSMBGA18
WW SKU	353S04032	RFSKU:RS	U_LBDSM_C	CRITICAL	1	IC,DSM,LB,SKY53924,DSMBGA18
RS SKU	353S04052	RFSKU:ROW	U_LBDSM_C	CRITICAL	1	IC,RS,DSM,LB,SKY53925,DSMBGA18
RS SKU	353S04052	RFSKU:CHN	U_LBDSM_C	CRITICAL	1	IC,RS,DSM,LB,SKY53925,DSMBGA18



USID 0X5

MIMO DSM



Apple Proprietary and Confidential

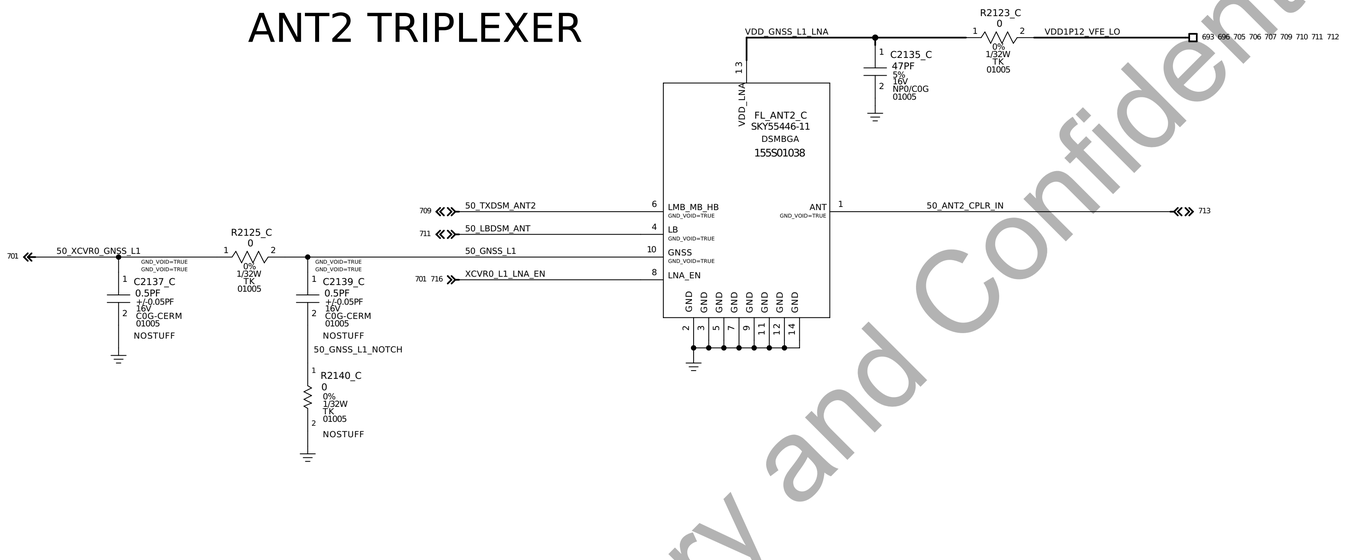
PAGE TITLE
FR1 UAT RX (1/2) (20)

Apple Inc.

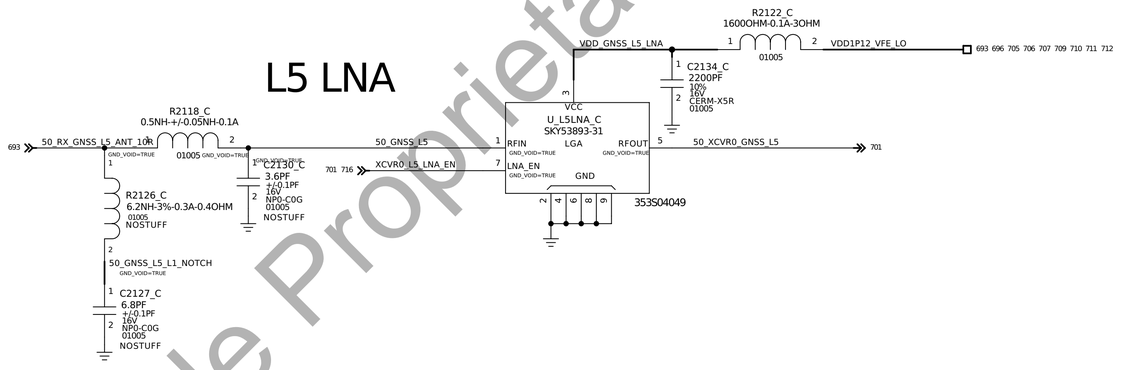
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 UAT RX (2/2)

ANT2 TRIPLEXER



L5 LNA



Apple Proprietary and Confidential

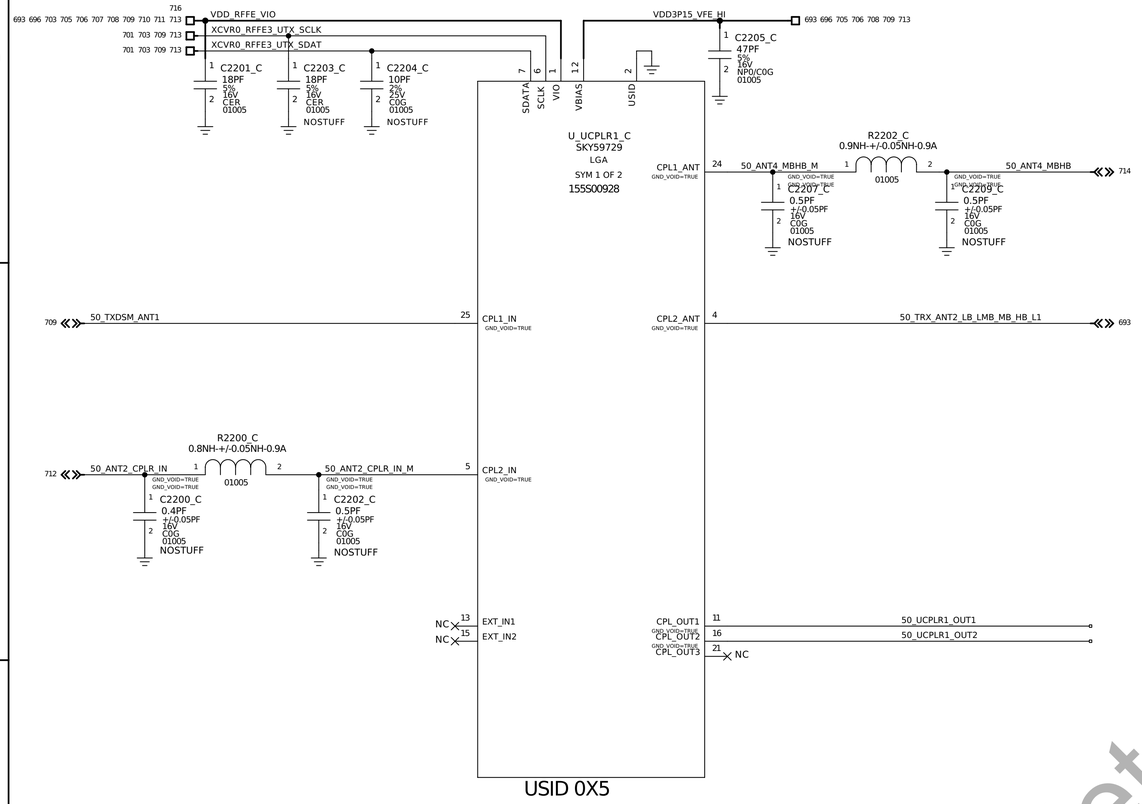
PAGE TITLE
FR1 UAT RX (2/2) (21)

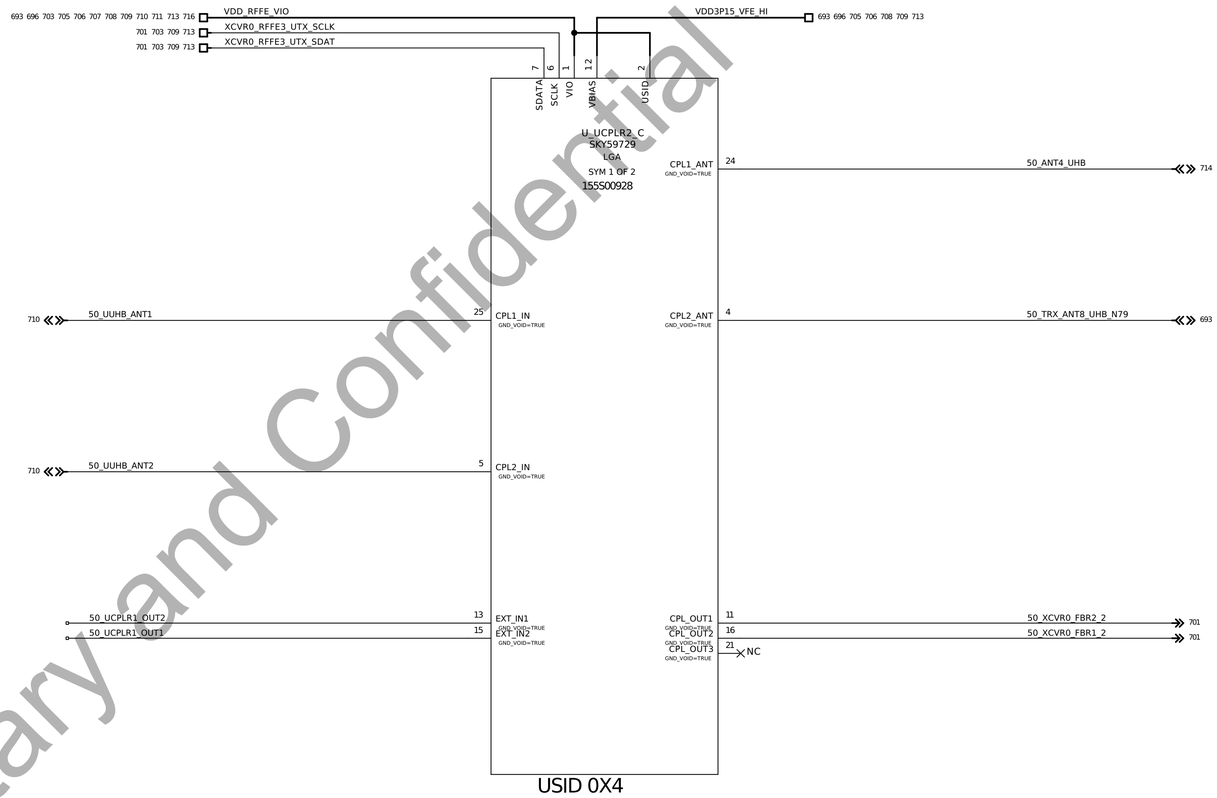
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

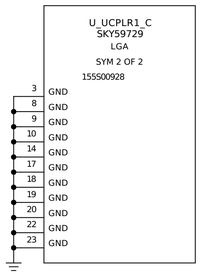
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 UAT COUPLERS

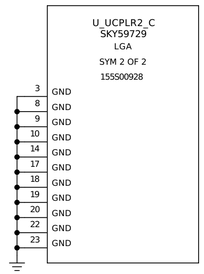




DUAL COUPLER



DUAL COUPLER



Apple Proprietary and Confidential

PAGE TITLE

FR1 UAT COUPLERS (22)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 UAT ANTENNAS & GPS

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLASS OVERRIDE
CLASS NAME	...	CONSTRAINT SET	DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
50_ANT4_MBHB	P	A_50_WIDE_L3-THIN_SE	50_ANT4_MBHB, 50_ANT4_M	?
50_ANT4_UAT2	P	A_50_WIDE_L3-HWIDE_SE	50_TRX_ANT4_MB_HB_WLAN24	?
50_ANT2_CPLR	P	A_50_THIN_SE	50_ANT2_CPLR_IN, 50_ANT2_CPLR_IN_M	?
50_ANT10_GNSS_L5	P	A_50_WIDE_L3-HWIDE_SE	50_RX_GNSS_L5_ANT_10L, 50_GNSS_L5	?
50_WIDE_SURFACE_THIN_SE	P	A_50_WIDE_SURFACE_THIN_SE	50_TXDSM_TXIN, 50_LUHB_ANT3, 50_TXDSM_ANT3	?

<HIER SCHEMATIC> | <TOP SCHEMATIC>

50_ANT4 = 50_TRX_ANT4_MB_HB_WLAN24

50_ANT10 = 50_RX_GNSS_L5_ANT_10L

SPACING (SCSET)

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLASS OVERRIDE
CLASS NAME	...	CONSTRAINT SET	DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
50_ANT4_MBHB	S	A_DIELECTRIC_2X_50_WIDE_SE	=	?
50_ANT4_UAT2	S	A_DIELECTRIC_2X_50_WIDE_SE	=	?
50_ANT2_CPLR	S	A_DIELECTRIC_2X_50_WIDE_SE	=	?
50_ANT10_GNSS_L5	S	A_DIELECTRIC_2X_50_WIDE_SE	=	?
50_WIDE_SURFACE_THIN_SE	S	A_DIELECTRIC_2X_50_WIDE_SURFACE_THIN_SE	=	?

SPACING MATRIX

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_ANT4_MBHB	50_WIDE_SE	A_DIELECTRIC_3.2XV_50_WIDE_SE
50_ANT4_MBHB	50_THIN_SE	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_LMB_HB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_UHB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_TXDSM_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	GND	A_DIELECTRIC_1.6X_50_WIDE_SE

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_ANT4_MBHB	50_ANT4_MBHB	A_DIELECTRIC_3.2XV_50_WIDE_SE
50_ANT4_MBHB	50_ANT4_UAT2	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_ANT2_CPLR	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_MBHB	50_ANT10_GNSS_L5	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_ANT4_UAT2	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_ANT2_CPLR	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_ANT10_GNSS_L5	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_ANT2_CPLR	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_ANT10_GNSS_L5	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_ANT10_GNSS_L5	A_DIELECTRIC_4XD_50_WIDE_SE

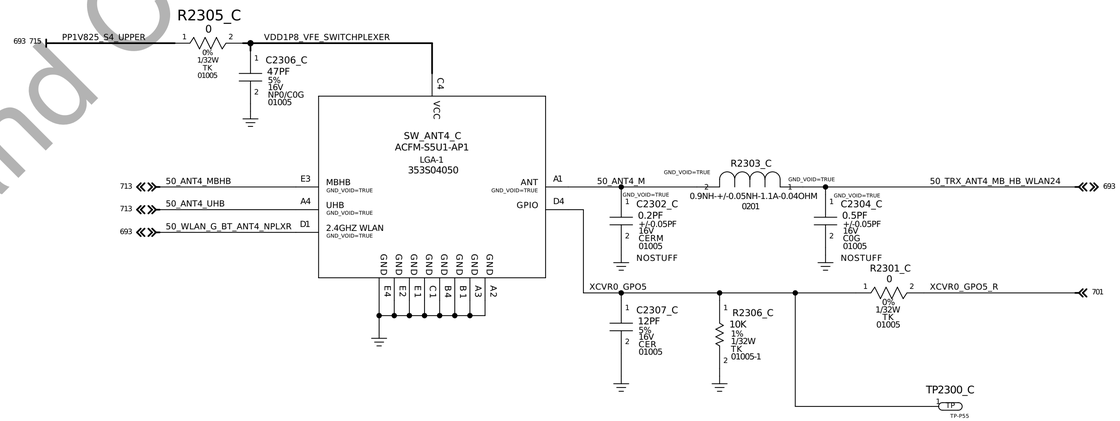
CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_ANT4_UAT2	50_WIDE_SE	A_DIELECTRIC_3.2XV_50_WIDE_SE
50_ANT4_UAT2	50_THIN_SE	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_LMB_HB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_UHB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_TXDSM_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT4_UAT2	GND	A_DIELECTRIC_1.6X_50_WIDE_SE

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_ANT2_CPLR	50_WIDE_SE	A_DIELECTRIC_3.2XV_50_WIDE_SE
50_ANT2_CPLR	50_THIN_SE	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_LMB_HB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_UHB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_TXDSM_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT2_CPLR	GND	A_DIELECTRIC_1.6X_50_WIDE_SE

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_ANT10_GNSS_L5	50_WIDE_SE	A_DIELECTRIC_3.2XV_50_WIDE_SE
50_ANT10_GNSS_L5	50_THIN_SE	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_LMB_HB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_UHB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_TXDSM_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_ANT10_GNSS_L5	GND	A_DIELECTRIC_1.6X_50_WIDE_SE

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_WIDE_SURFACE_THIN_SE	GND	A_DIELECTRIC_1.6X_50_WIDE_SURFACE_THIN_SE

ANT4 SWITCHPLEXER



VCC=1.8, VIH=0.95V

Apple Proprietary and Confidential

PAGE TITLE

FR1 UAT ANTENNAS & GPS (23)

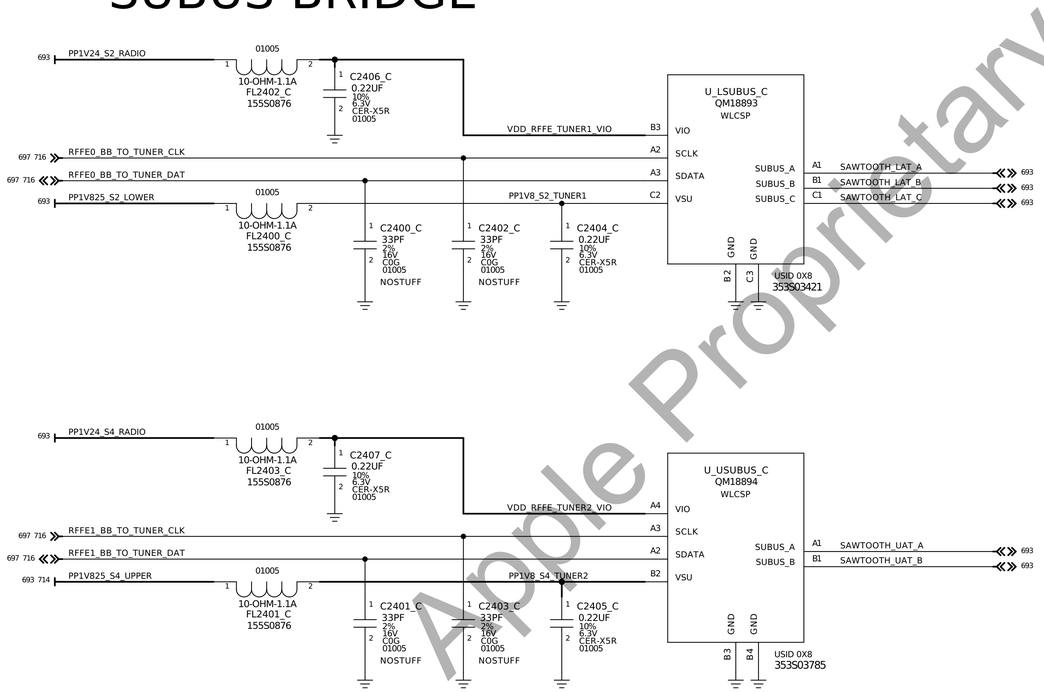
Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

FR1 ANTENNA TUNERS

SUBUS BRIDGE



UAT TUNERS KEPT POWERED UP IN LPEM (S4)

Apple Proprietary and Confidential

PAGE TITLE

FR1 ANTENNA TUNERS (24)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

PP2501_C 1 90_PCIE_GP1_AP_TO_BB_REFCLK_P 693 697
PP2502_C 1 90_PCIE_GP1_AP_TO_BB_REFCLK_N 693 697
PP2503_C 1 90_PCIE_GP1_AP_TO_BB_TX_P 693 697
PP2504_C 1 90_PCIE_GP1_AP_TO_BB_TX_N 693 697
PP2505_C 1 90_PCIE_GP1_AP_FROM_BB_RX_P 693 697
PP2506_C 1 90_PCIE_GP1_AP_FROM_BB_RX_N 693 697

BB_TO_AP PCIE PROBE POINTS PLACED CLOSER TO LEDA DUE TO ROUTING

PP2507_C 1 PCIE_GP1_AP_TO_BB_PERST_L 693 697
PP2508_C 1 PCIE_GP1_AP_BI BB_CLKREQ_L 693 697
PP2509_C 1 GPIO_PMU_FROM_BB_PCIE_HOST_WAKE 693 697

PP2511_C 1 BB_TO_DDR_SLEEP_RESET_L 697
PP2512_C 1 GPIO_NUB_FROM_BB_WDOG_L 693 697

PP2515_C 1 IO_BB_FROM_SIM1_DETECT 693 697 698
PP2516_C 1 SIM0_RST 697 698
PP2517_C 1 SIM1_RST 697 698
PP2518_C 1 SIM0_CLK 697 698
PP2519_C 1 SIM1_CLK 697 698
PP2520_C 1 SIM0_DAT 697 698
PP2521_C 1 SIM1_DAT 697 698

PP2524_C 1 UART_MEMS_TD 697 700 701

PP2523_C 1 TP_GPIO0 697
PP2525_C 1 TP_COEX_GPIO0 697
PP2526_C 1 TP_ANALOGMUX_OUT 697
PP2527_C 1 TP_DBGWRAP_TEST_PORT 697
PP2528_C 1 GPIO_BB_TO_NUB_GSM_TXBURST_IND 693 697

PP2500_C 1 TP_TST_CLKOUT 697

PP2530_C 1 RFFE0_BB_TO_TUNER_CLK 697 715
PP2531_C 1 RFFE0_BB_TO_TUNER_DAT 697 715
PP2532_C 1 RFFE1_BB_TO_TUNER_CLK 697 715
PP2533_C 1 RFFE1_BB_TO_TUNER_DAT 697 715

PP2549_C 1 DWB_SCLK 697 701
PP2550_C 1 DWB_SDAT 697 701
PP2551_C 1 XCVR0_DWB_IRQ 697 701

PP2565_C 1 SPI1_AOP_TO_GNSS_SCLK 693 701
PP2566_C 1 SPI1_AOP_FROM_GNSS_MISO 693 701
PP2567_C 1 SPI1_AOP_TO_GNSS_MOSI 693 701
PP2568_C 1 GPIO_SCM_AOP_TO_GNSS_SPI_CS_L 693 701
PP2570_C 1 GPIO_AOP_FROM_GNSS_HOST_REQ 693 701

GNSS

PP2561_C 1 XCVR0_L1_LNA_EN 701 712
PP2562_C 1 XCVR0_L5_LNA_EN 701 712
PP2563_C 1 BB_TO_GNSS_TIMEMARK 697 701

RESET

PP2564_C 1 XCVR0_RESET_L 697 701

CLOCKS

PP2571_C 1 GPIO_SEQ_PMU_TO_BBPMU_RESET_L 693 695 697 716
PP2572_C 1 BB_TO_BBPMU_SOCHOT_L 695 697

PP2574_C 1 BBPMU_TO_BB_RESET_L 695 697
PP2575_C 1 TP_BBPMU_GPIO0 695

PP2577_C 1 GPIO_NFC_P_TO_BBPMU_CLK_EN 693 695

PP2560_C 1 VDD_RFFE_VIO 693 696 703 705 706 707 708 709 710 711 713

PP2538_C 1 BBPMU_TO_MEMS_CLKEN 695 700
PP2539_C 1 XCVR0_CLK_REQ 695 700 701

PP2540_C 1 CLK_MEMS_TO_BBPMU_38M4 695 700
PP2541_C 1 50_CLK_MEMS_TO_BB_38M4 697 700
PP2542_C 1 50_CLK_MEMS_TO_XCVR0_76M8 700 701

PP2544_C 1 CLK32K_BB_XCVR0 695 697 701

MPHY

PP2545_C 1 85_MPHY_XCVR0_TO_BB_RX0_P 697 701
PP2546_C 1 85_MPHY_XCVR0_TO_BB_RX0_N 697 701
PP2547_C 1 85_MPHY_BB_TO_XCVR0_TX0_P 697 701
PP2548_C 1 85_MPHY_BB_TO_XCVR0_TX0_N 697 701

PP2579_C 1 100_XCVR0_ET1_1P 701 703
PP2580_C 1 100_XCVR0_ET1_1N 701 703
PP2581_C 1 100_XCVR0_ET2_1P 701 703
PP2582_C 1 100_XCVR0_ET2_1N 701 703
PP2583_C 1 100_XCVR0_ET1_2P 701 703
PP2584_C 1 100_XCVR0_ET1_2N 701 703

DEBUG CONNECTOR

NOSTUFF
J_DEBUG_C
BM55P0.5-14DP/2-0.3V(51)
M-ST-SM

MLB :516S00905 <-- THIS
FLEX :516S00904

	15	16			
90_EUSB_CARRIER_P	1	2	UART_BB_TO_AP_RXD		697
90_EUSB_CARRIER_N	3	4	UART_AP_TO_BB_TXD		697
CARRIER_DET	5	6	SIM0_CLK_DEBUG		698
SWD_NUB_BI_BB_SWDIO	7	8	SIM0_DAT_DEBUG		698
SWD_NUB_TO_BB_SWCLK	9	10	IO_BB_FROM_SIM0_DETECT		693 697
GPIO_SEQ_PMU_TO_BBPMU_RESET_L	11	12	IO_BB_TO_SIM0_RESET		693 698
PP1V8_CARRIER	13	14	PP_VDD_SIM0		693 696 698
PP_VDD_MAIN_BBPMU	17	18			

693 695 697 701
693 695 697 701
693 695 697 716
693 695 696

516S00905

GPIO_NUB_TO_BB_DEBUG_EN 693 697
R2503_C 4.99K 1% 1/32W TK 01005 NOSTUFF
CARRIER_DET
R2500_C 10K 1% 1/32W TK 01005-1 NOSTUFF

STUFF ONLY ON MLB_BOT ONLY CONFIGS

R2508_C 0 0% 1/32W TK 01005 NOSTUFF
PP1V825_S2_BB 693 695

R2502_C 0 0% 1/32W TK 01005 NOSTUFF
PP1V8_CARRIER
PP1V825_S4_BB 693 695 696

SENSE

TP2500_C	A	SENSE_ACM_P	698
TP2501_C	A	SENSE_ACM_N	699
TP2502_C	A	SENSE_CPU_P	698
TP2503_C	A	SENSE_CPU_N	699
TP2504_C	A	SENSE_DDR_P	698
TP2505_C	A	SENSE_DDR_N	699
TP2506_C	A	SENSE_VDDQL	698
TP2507_C	A		

TP-P55

32K MEMS CFRE EXCURSION VALIDATION

REMOVED

32K MEMS MEASUREMENT POINT

PP2585_C 1 CLK32K_BBPMU_1V8_R 695
PP2586_C 1

ALT2 REMOVED

KIS

NOSTUFF
R2504_C 0 0% 1/32W TK 01005
R2505_C 0 0% 1/32W TK 01005 NOSTUFF
R2506_C 0 0% 1/32W TK 01005
R2507_C 0 0% 1/32W TK 01005 NOSTUFF

697 90_EUSB_KIS_P
697 90_EUSB_KIS_N
90_EUSB_BB_DBG_P 693
90_EUSB_BB_DBG_N 693
90_EUSB_CARRIER_P
90_EUSB_CARRIER_N

Apple Proprietary and Confidential

PAGE TITLE
TEST POINTS (25)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

CONSTRAINTS

90-ohm Diff Pair Constraints

Electrical

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
E_MPHY_XCVR0	E	DIFF_PAIR_MPHY_XCVR0	DP:DP_85_MPHY*XCVR0*	?
E_PCIE_BB	E	DIFF_PAIR	DP:DP_90_PCIE*BB*	?
E_EUSB_BB	E	DIFF_PAIR	DP:DP_90_EUSB*	?

Physical

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
85_MPHY_XCVR0	P	A_85_OHM_DIFF	DP:DP_85_MPHY*XCVR0*	?
90_PCIE_BB	P	A_90_OHM_DIFF	DP:DP_90_PCIE*BB*	?
90_EUSB_BB	P	A_90_OHM_DIFF	DP:DP_90_EUSB*	?

Spacing

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
85_MPHY_XCVR0	S	A_DIELECTRIC_3X	=	?
90_PCIE_BB	S	A_DIELECTRIC_3X	=	?
90_EUSB_BB	S	A_DIELECTRIC_3X	=	?

POWER CONSTRAINTS

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
PWR_SHAPE	P	PWR_SHAPE	VDD0P97_RF_LO*	?
PWR_SHAPE	P	PWR_SHAPE	VDD0P63_XCVR0_DIG*	?
PWR_300UM	P	PWR_300UM	VDD1P12_VFE_LO	?
PWR_300UM	P	PWR_300UM	VDD3P15_VFE_HI	?
PWR_SHAPE	P	PWR_SHAPE	VDD0P78_FIXED	?
PWR_SHAPE	P	PWR_SHAPE	VDD1P25_RF_HI	?
PWR_300UM	P	PWR_300UM	VDD1P5_MEMS	?
PWR_150UM	P	PWR_150UM	VDD_RFFE_VIO*	?
PWR_SHAPE	P	PWR_SHAPE	VPAL*, VPAU*	?
PWR_SHAPE	P	PWR_SHAPE	VPA_ET*, VPA_ZG*, VPA_AUXP*	?
PWR_300UM	P	PWR_300UM	VDD_*LNA	?
PWR_SHAPE	P	PWR_SHAPE	VDD1P0_DIG1	?
PWR_SHAPE	P	PWR_SHAPE	VDD0P78_SRAM	?
PWR_SHAPE	P	PWR_SHAPE	VDD0P86_DIG2, VDD0P84_DIG3	?
PWR_SHAPE	P	PWR_SHAPE	VDD0P78_BB_FIXED	?
PWR_500UM	P	PWR_500UM	VDD1P25_BB_RF_HI	?
PWR_300UM	P	PWR_300UM	VDD1Z_IO*	?
PWR_SHAPE	P	PWR_SHAPE	VDD1P1	?
PWR_150UM	P	PWR_150UM	VDD0P6_VDDQL	?
PWR_150UM	P	PWR_150UM	VDD0P77_LOW	?
PWR_150UM	P	PWR_150UM	VDD_SIM0, VDD_SIM1, VDD1P8_SIM0, VDD1P8_SIM1	?
PWR_150UM	P	PWR_150UM	VDD3P4_BOOST	?
PWR_150UM	P	PWR_150UM	PP1VX_EEPROM	?
PWR_150UM	P	PWR_150UM	VDD_RF_HI_ULPULL, VDD0P6_BBPMU_VREF	?
PWR_150UM	P	PWR_150UM	VDD_RF_HI_ULPLL, VDD_SHAPER	?
PWR_500UM	P	PWR_500UM	VDD1P2_BBPMU_INT	?
PWR_150UM	P	PWR_150UM	VDD1P5_3079_FILT	?
PWR_500UM	P	PWR_500UM	VDD1P8	?
PWR_300UM	P	PWR_300UM	VDD1P8_CLKBUFF	?
PWR_300UM	P	PWR_300UM	VDD1P25_RF_HI_*	?
PWR_300UM	P	PWR_300UM	PP1V8_CARRIER, PP1V8_CLK32K	?

SENSITIVE TRACE SHIELD

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
RF_SHIELD	S	A_DIELECTRIC_3X	SENSE*, CLK_BBPMU*	?
RFFE_SHIELD	S	A_DIELECTRIC_1.5X	DWB_*, XCVR0_RFFE*, RFFE*BB*,SHIELD_RFFE*	?
ET_DIFF	S	A_DIELECTRIC_3X	100_XCVR0_ET*	?
50_CLK_SE	S	A_DIELECTRIC_3X	50_REFLO*	?
RF_SHIELD	S	A_DIELECTRIC_3X	SNS*, FB*	?
RF_SHIELD	S	A_DIELECTRIC_3X	BB_DDR_RREF, BB_DDR_ZQ*	?
RF_SHIELD	S	A_DIELECTRIC_3X	100_PCIE*, 100_MPHY*, 90_EUSB*, 90_USB*	?
CLK_SPMI	S	A_DIELECTRIC_1.5X	SPMI*CLK*	?
GRP_SPMI_DATA	S	DEFAULT	SPMI*DAT*	?
CLK_SHIELD	S	A_DIELECTRIC_3X	=	?

PHYSICAL (PCSET)

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
DP_GENERIC	P	GENERIC_DIFF_05	DP:DP_SENSE*	?

RF CONSTRAINTS (OPTIMIZED BY LAYOUT)
TABLE CONTINUED ON FR1 UAT ANTENNAS & GPS PAGE (PAGE 24)

Grouping Constraints

Physical

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
GRP_GPIO	P	DEFAULT	GPIO*, IO_*	Y
GRP_I2C	P	DEFAULT	I2C*	Y
GRP_SPI	P	DEFAULT	SPI*MOSI*, SPI*MISO*, SPI*CS*	Y
GRP_UART	P	DEFAULT	UART*	Y
GRP_SWD	P	DEFAULT	SWD*	Y
GRP_PCIE_SIDE	P	DEFAULT	PCIE*CLKREQ*, PCIE*PERST*	Y
GRP_MISC	P	DEFAULT	RFFE*RST*, SDR*EN	Y
GRP_RFFE	P	DEFAULT	XCVR0_RFFE*	Y

Spacing

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
GRP_GPIO	S	DEFAULT	=	Y
GRP_I2C	S	DEFAULT	=	Y
GRP_I2S	S	DEFAULT	=	Y
GRP_SPI	S	DEFAULT	=	Y
GRP_UART	S	DEFAULT	=	Y
GRP_SWD	S	DEFAULT	=	Y
GRP_PCIE_SIDE	S	DEFAULT	=	Y
GRP_MISC	S	DEFAULT	=	Y

RF CONSTRAINTS

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
CLK_SHIELD	P	DEFAULT	CLK32K_*,CLK_MEMS_TO_*,CLK_BBPMU_TO_*	?
50_CLK_SE	P	A_50_THIN_SE	50_REFLO*	?
50_THIN_SE	P	A_50_THIN_SE	50_GNSS_L1*	?
50_THIN_SE	P	A_50_THIN_SE	50_HB*	?
50_THIN_SE	P	A_50_THIN_SE	50_LB_*, 50_LBDSM_RX*, 50_LBDSM_ANT*, 50_LBDSM_M	?
50_THIN_SE	P	A_50_THIN_SE	50_LCPLR*	?
50_THIN_SE	P	A_50_THIN_SE	50_LNRU*	?
50_THIN_SE	P	A_50_THIN_SE	50_LUHB_TX*, 50_LUHB_N*, 50_LUHB_ANT1*, 50_LUHB_ANT2*	?
50_THIN_SE	P	A_50_THIN_SE	50_LUHB_ANT3_M	?
50_THIN_SE	P	A_50_THIN_SE	50_LWIFI*	?
50_THIN_SE	P	A_50_THIN_SE	50_TXDSM_MIMO*, 50_TXDSM_RX*, 50_TXDSM_MHB*	?
50_THIN_SE	P	A_50_THIN_SE	50_UCPLR*	?
50_THIN_SE	P	A_50_THIN_SE	50_UNRU*	?
50_WIDE_SE	P	A_50_WIDE_SE	50_ANT4_MBHB_M	?
50_THIN_SE	P	A_50_THIN_SE	50_UMIMO*, 50_LMIMO*	?
50_THIN_SE	P	A_50_THIN_SE	50_UUHB*, 50_UHBDSM*	?
50_THIN_SE	P	A_50_THIN_SE	50_UWIFI*	?
50_WIDE_SE	P	A_50_WIDE_SE	50_ANT4_UHB	?
50_THIN_SE	P	A_50_THIN_SE	50_VCXO*	?
50_THIN_SE	P	A_50_THIN_SE	50_XCVR0_FBR*	?
50_THIN_SE	P	A_50_THIN_SE	50_XCVR0_GNSS*	?
ET_DIFF	P	A_100_OHM_DIFF	DP:DP_100_XCVR*_ET*	?
50_WIDE_SE	P	A_50_WIDE_SE	50_LBDSM_TXIN, 50_LUHB_ANT3_U, 50_TXDSM_ANT2*	?
50_WIDE_SE	P	A_50_WIDE_SE	50_ANT1*, 50_ANT3*, 50_ANT5*	?
50_WIDE_SE	P	A_50_WIDE_SE	50_ANT6*, 50_ANT7*, 50_ANT8*, 50_ANT9*	?
50_WIDE_SE	P	A_50_WIDE_SE	50_ANT2	?
50_THIN_SE	P	A_50_THIN_SE	50_TXDSM_ANT1*, 50_TXDSM_ANT3_M	?
50_CLK_THIN	P	A_50_THIN_SE	50_CLK_XCVR1	?
50_FBR_THIN	P	A_50_THIN_SE	50_*FBR*	?

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
50_LMB_HB_RX	P	A_50_THIN_SE	50_XCVR0_RX1,50_XCVR0_RX2,50_XCVR0_RX3,50_XCVR0_RX4	?
50_LMB_HB_RX	P	A_50_THIN_SE	50_XCVR0_RX5,50_XCVR0_RX6,50_XCVR0_RX7,50_XCVR0_RX8	?
50_UHB_RX	P	A_50_THIN_SE	50_XCVR0_RX9*,50_XCVR0_RX10,50_XCVR0_RX11*,50_XCVR0_RX12	?
50_UHB_RX	P	A_50_THIN_SE	50_XCVR0_RX13*,50_XCVR0_RX14,50_XCVR0_RX15*,50_XCVR0_RX16	?
50_UHB_RX	P	A_50_THIN_SE	50_XCVR0_RX17,50_XCVR0_RX18	?
50_LMB_HB_RX	P	A_50_THIN_SE	50_XCVR0_RX21,50_XCVR0_RX22,50_XCVR0_RX23,50_XCVR0_RX24	?
50_LMB_HB_RX	P	A_50_THIN_SE	50_XCVR0_RX25,50_XCVR0_RX26,50_XCVR0_RX27,50_XCVR0_RX28	?
50_LMB_HB_RX	P	A_50_THIN_SE	50_XCVR0_RX29,50_XCVR0_RX30	?
50_2G_LB_SPAD_TX	P	A_50_THIN_SE	50_XCVR0_TX1_LB,50_XCVR0_TX2_LB,50_XCVR0_TX0_2G	?
50_HB_SPAD_TX	P	A_50_THIN_SE	50_XCVR0_TX1_MBHB1,50_XCVR0_TX2_MBHB	?
50_HB_SPAD_TX	P	A_50_THIN_SE	50_XCVR0_TX1_LMB*,50_XCVR0_TX2_LMB*	?
50_UHB_SPAD_LAT_TX	P	A_50_THIN_SE	50_XCVR0_TX1_UHB1,50_XCVR0_TX2_UHB,50_XCVR0_TX2_CB1	?
50_TXDSM_TX	P	A_50_THIN_SE	50_XCVR0_TX1_MBHB2,50_XCVR0_TX3_HB	?
50_UHB_SPAD_UAT_TX	P	A_50_THIN_SE	50_XCVR0_TX1_UHB2,50_XCVR0_TX3_UHB,50_XCVR0_TX3_CB1	?

SPACING (SCSET)

CLASS DEFINITIONS			COMMA SEPARATED WITH WILDCARD SUPPORT: NET NAMES EX: DDR*	CLEAR OVERRIDE
CLASS NAME	CONSTRAINT SET		DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)	Y/N
DP_GENERIC	S	A_DIELECTRIC_3X	=	?
RF_SHIELD	S	A_DIELECTRIC_3X	=	?
50_WIDE_SE	S	A_DIELECTRIC_2X_50_WIDE_SE	=	?
50_THIN_SE	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
ET_DIFF	S	A_DIELECTRIC_3X	=	?
50_LMB_HB_RX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_UHB_RX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_2G_LB_SPAD_TX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_HB_SPAD_TX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_UHB_SPAD_LAT_TX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_TXDSM_TX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_UHB_SPAD_UAT_TX	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_CLK_THIN	S	A_DIELECTRIC_3X	=	?
50_FBR_THIN	S	A_DIELECTRIC_2X_50_THIN_SE	=	?
50_MMW_BG1_SE	S	NA_DIELECTRIC_2X_50_MMW_BG1_SE	=	?
50_MMW_BG2_SE	S	NA_DIELECTRIC_2X_50_MMW_BG2_SE	=	?
50_MMW_IF	S	NA_DIELECTRIC_2X_50_MMW_IF_SE	=	?
50_MMW_BG1_MB_SE	S	NA_DIELECTRIC_2X_50_MMW_BG1_SE	=	?

SPACING MATRIX

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
ET_DIFF	GND	DEFAULT
RF_SHIELD	GND	DEFAULT
RFFE_SHIELD	GND	DEFAULT
DP_GENERIC	GND	DEFAULT
50_WIDE_SE	50_WIDE_SE	A_DIELECTRIC_3.2XV_50_WIDE_SE
50_WIDE_SE	50_THIN_SE	A_DIELECTRIC_4XD_50_WIDE_SE
50_WIDE_SE	50_LMB_HB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_WIDE_SE	50_UHB_RX	A_DIELECTRIC_4XD_50_WIDE_SE
50_WIDE_SE	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_WIDE_SE	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_WIDE_SE	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_WIDE_SE	50_TXDSM_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_WIDE_SE	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_WIDE_SE
50_THIN_SE	50_THIN_SE	A_DIELECTRIC_4XD_50_THIN_SE
50_THIN_SE	50_LMB_HB_RX	A_DIELECTRIC_4XD_50_THIN_SE
50_THIN_SE	50_UHB_RX	A_DIELECTRIC_4XD_50_THIN_SE
50_THIN_SE	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_THIN_SE	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_THIN_SE	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_THIN_SE	50_TXDSM_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_THIN_SE	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_LMB_HB_RX	50_UHB_RX	A_DIELECTRIC_2x
50_LMB_HB_RX	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_LMB_HB_RX	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_LMB_HB_RX	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_LMB_HB_RX	50_TXDSM_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_LMB_HB_RX	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_UHB_RX	50_2G_LB_SPAD_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_UHB_RX	50_HB_SPAD_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_UHB_RX	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_UHB_RX	50_TXDSM_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_UHB_RX	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_4XD_50_THIN_SE
50_LMB_HB_RX	50_LMB_HB_RX	A_DIELECTRIC_2X
50_UHB_RX	50_UHB_RX	A_DIELECTRIC_2X
50_2G_LB_SPAD_TX	50_2G_LB_SPAD_TX	A_DIELECTRIC_2X
50_HB_SPAD_TX	50_HB_SPAD_TX	A_DIELECTRIC_2X
50_UHB_SPAD_LAT_TX	50_UHB_SPAD_LAT_TX	A_DIELECTRIC_2X
50_TXDSM_TX	50_TXDSM_TX	A_DIELECTRIC_2X
50_UHB_SPAD_UAT_TX	50_UHB_SPAD_UAT_TX	A_DIELECTRIC_2X
50_CLK_THIN	50_CLK_THIN	A_DIELECTRIC_3X_50_CLK_THIN_SE
50_FBR_THIN	50_FBR_THIN	A_DIELECTRIC_4XV_50_THIN_SE

POWER LX - CLASS-CLASS SPACING

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
PWR_SHAPE_LX	CLK	A_DIELECTRIC_3X
PWR_SHAPE_LX	CLK_SPI	A_DIELECTRIC_3X
PWR_SHAPE_LX	PWR_SHAPE_LX	DEFAULT
PWR_SHAPE_LX	GND	DEFAULT
PWR_SHAPE_LX	RF_SHIELD	A_DIELECTRIC_3X
PWR_SHAPE_LX	RFFE_SHIELD	A_DIELECTRIC_3X
PWR_SHAPE_LX	ET_DIFF	A_DIELECTRIC_3X
PWR_SHAPE_LX	50_CLK_SE	A_DIELECTRIC_3X
PWR_SHAPE_LX	CLK_SPMI	A_DIELECTRIC_3X
PWR_SHAPE_LX	GRP_SPMI_DATA	A_DIELECTRIC_3X

Class-Class Spacing

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
90_PCIE_BB	GND	A_DIELECTRIC_3X
90_EUSB_BB	GND	A_DIELECTRIC_2X
85_MPHY_XCVR0	GND	DEFAULT

CLASS TO CLASS SPACING		
CLASS NAME	CLASS NAME	CONSTRAINT SET
50_WIDE_SE	GND	A_DIELECTRIC_1.6X_50_WIDE_SE
50_THIN_SE	GND	A_DIELECTRIC_2X_50_THIN_SE
50_LMB_HB_RX	GND	A_DIELECTRIC_2X_50_THIN_SE
50_UHB_RX	GND	A_DIELECTRIC_2X_50_THIN_SE
50_2G_LB_SPAD_TX	GND	A_DIELECTRIC_2X_50_THIN_SE
50_HB_SPAD_TX	GND	A_DIELECTRIC_2X_50_THIN_SE
50_TXDSM_TX	GND	A_DIELECTRIC_2X_50_THIN_SE
50_UHB_SPAD_UAT_TX	GND	A_DIELECTRIC_2X_50_THIN_SE
50_CLK_SE	GND	DEFAULT
RF_SHIELD	RF_SHIELD	A_DIELECTRIC_3X
CLK_SPMI	GRP_SPMI_DATA	A_DIELECTRIC_1.5X
CLK_SHIELD	GND	DEFAULT

Apple Proprietary and Confidential

PAGE TITLE
CONSTRAINTS (26)

Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED